THE
LIFE INSURANCE EXAMINER.

STILLMAN

THE

Life Insurance Examiner.

A PRACTICAL TREATISE

UPON

MEDICAL EXAMINATIONS FOR LIFE INSURANCE

BY

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To RICHARD A. McCURDY, Esq., this book is respectfully dedicated as a token of personal esteem by

THE AUTHOR.

PREFACE.

IT is a natural inquiry on the part of a newly appointed Medical Examiner: "How shall I most satisfactorily perform the duties of my position?"

The function of a medical college is to teach principles, and the object of this book is to apply those principles to the requirements of the Life Insurance Examiner.

In the present work the author aims to present a concise, practical manual, which will enable even the beginner in life insurance examinations to conduct an examination satisfactorily to the company by whom he is employed—to the applicant and to himself—and it is intended to be a systematic and complete treatise upon the subject of life insurance examinations. It represents the results of many years of practical experience in the department of which it treats, and the author takes pleasure in acknowledging the valuable services of Dr. George D. Clift in its preparation.

INTRODUCTION.

IN the early days of life insurance in this country, very few questions were propounded by the Medical Examiner, all questions referring to the family and personal history of the applicant being answered by the agent, who filled out the application, so that the Medical Examiner had very little more to do than inspect the applicant. But during recent years, the Examiner has been obliged to answer more of the questions contained in the application, until now, at least in most of the large companies, the Examiner is required to fill up all the questions relating to the application, except the mere request for insurance and the form of policy desired.

Every application does, or should, contain the question whether the applicant has been previously rejected or postponed by any other company, and if, upon examining an application, the Medical Examiner does not find this question, he should at once propound it to the applicant; and even if the question be found upon the application, and is answered, he should still observe the rule to propound the question before the examination is commenced, since agents, in writing an application, do not use sufficient care in regard to this question, and if it be incorrectly answered, it renders the policy void at the option of the company.

Then again, the fact of previous postponement or rejection should cause extra care in examination, it being to the Examiner's interest to discover, if possible, any cause for rejection or postponement which has been deemed by any other Examiner of sufficient importance to cause such action; it being understood, however, that the applicant, if no other reasonable cause for rejection or postponement can be found, is as much entitled to his insurance under the present examination as if he had not been previously rejected or postponed.

Be sure that the person who appears before you for examination is the individual who has signed the application. Never make an examination unless the *signed application* is before you, for several reasons. If signed afterwards, and not in your presence, a totally different person may be substituted for the one you have examined. It is, therefore, to avoid all chance of substitution, better to see an applicant write his name in the Examiner's presence, the Examiner then to compare the signature so written with the signature in the application. Some companies now carry this idea so far as to make it unnecessary for the Examiner to write the applicant's name at all, the applicant writing his own name three times, once on the application for insurance, and twice before the Medical Examiner—once his full name, and the second time his usual signature, to which the

Examiner then becomes witness. If, upon inspection, it being understood that the Examiner has no personal knowledge of the applicant, the signatures executed before him correspond with the signatures before the examination, the examination itself should then be proceeded with.

Owing to the competition now existing between the various life insurance companies, and the difficulty with which desirable applications are secured, it becomes a matter of paramount importance for the physician to so examine the applicant as to cause him to be friendly toward the company, and not to feel that he has been unduly or unnecessarily subjected to harsh or unbusiness-like treatment during the examination.

In many cases it is only by the most persistent solicitation, and after repeated and determined efforts on the part of the solicitor, that a man can be induced to apply for examination, and a genial manner on the part of the Examiner is of great importance, especially if the applicant is appearing for examination for the first time, as he is then more apt to be nervous and excited, not knowing but that some imperfections will be found in his organism before unknown to him, which will not only debar him from insurance, but will necessitate his taking medical advice from his family physician.

Another point which cannot be too strongly impressed upon the Examiner is that as an official of the company he represents, and paid as he is for his services by that company, he should retain such information as he elicits about an applicant for the company's own benefit; and even if he be the family physician of the applicant, he should remember that any point discovered by him during such examination is the property of the company, is paid for by the company, and is not the property of the applicant.

The Examiner should also remember that it is the business of an agent to procure the acceptance of a risk, if possible, and he should refuse to give an agent any information about an applicant unless authorized to do so in any particular case by the Medical Directors of the company for which he is examining. The neglect of this rule not only subjects the Medical Directory to annoyance from the agents, but also very frequently from the applicant himself, in case of rejection. On the other hand, the Examiner should remember that the applicant is *entitled* to his insurance in case he does not fall below the standard of excellence established by the company. But again it should be impressed upon him that no information relative to the case should be afforded either to applicant or to agent, for the latter has the power to apply directly to the home office of every company to learn the cause of postponement or rejection; and the responsibility of affording him information in such a case, or of affording the applicant information, should rest entirely with the executive department of the company for which the Examiner is acting, and not with the Examiner himself.

PART I.

LIFE INSURANCE FORMALITIES.

AS the Medical Examiner should make himself familiar with all the questions put to the insurance candidate, we insert the following list, classified from the forms used by six of the prominent insurance companies.

MEDICAL EXAMINER'S REPORT.

IDENTIFICATION.

SIGNATURE.—(Sign in the presence of the Medical Examiner.) Signature of the person examined in full. Did the applicant sign the above in your presence? Signature of the party or parties for whose benefit the insurance is to be effected (write in full).

RESIDENCE.—Country. State. County. Town. Place of business. P. O. Address. Former residence. Is the risk affected by the place of residence? Where has the party resided (during summer and winter) during the last ten years?

IDENTIFICATION.—(The examining physician is requested to satisfy himself in all cases as to the identity of the party being examined.) Do you know the applicant to be the person described in the application? Is he known to you? How long? How well? Mention some mark of identification. Place of birth. Date of birth.

ENVIRONMENT.

OCCUPATION.—Is there anything seriously unsanitary in the occupation, or in the residence or place of business? Does the person contem plate a change of residence? If so, when, to what place, and why? (That is, whether for purposes of business, health or pleasure.) Has he had yellow fever? If not, does yellow fever ever prevail where applicant resides? State how long he has lived in present locality; how long and when, in other localities similarly exposed? Is he thoroughly acclimatized.

Is the risk affected by anything in his residence or occupation? (State definitely; if more than one occupation, state all of them. If on railroad, say how employed.) Former occupation, if recently changed. Is applicant *in any way* engaged in the sale of malt or alcoholic liquors? Is there any intention of changing residence or occupation? If so, state intention. Has change of climate ever been sought or advised for the benefit of

your health? Have you ever resided out of the United States? If so, where and for what period? Was it on account of ill health?

In giving the occupation of the party, it is not sufficient to state (for example) that he is a merchant, mechanic or clerk, but the particular branch of business or trade must be specified, and full particulars given where the occupation is in any way hazardous. Does the party agree not to reside or travel within the tropics, and not to engage in blasting, mining, sub-marine operations, aeronautic ascensions, or in service upon any railroad train, or in switching or coupling cars, or upon any steam or other vessel, during the next two years following the date of any policy issued hereon, without first obtaining the written permission of this company?

Has the applicant ever changed his residence or traveled on account of his health, or has his health been affected by any Southern or foreign residence?

Is applicant married or single?

PHYSIQUE.

Age? Temperament? Race or nationality? Complexion? Weight (coat and vest off)? Height (in shoes)? Girth of chest, under vest, forced expiration? Same, forced inspiration? Girth of abdomen, at waistband of trousers? If under or over-weight, is this feature an individual or family trait? Any deformity? Any injury or loss of limb? (If of lower extremity, state whether thigh or leg amputation.) Any rupture? If so, is truss worn? State the kind of hernia? Figure? Color of hair and eyes? Has the weight recently increased or diminished—and from what cause? Which parent does he resemble most in general temperament and constitution? Can you answer from personal knowledge? Does his appearance indicate health and vigor?

HEREDITARY INFLUENCES.

Inquire of applicant, and set down below, as particularly as you can, the vital statistics of the family.

FAMILY RECORD OF APPLICANT.

	LIVING.		DEAD.		
	Age?	Health?	Age?	Specific Cause of Death?	How Long Sick?
Father.....					
Father's father.....					
Father's mother....					
Mother					
Mother's father ...					
Mother's mother...					

	Living.		Dead.		
	Age?	Health?	Age?	Specific Cause of Death?	How Long Sick?
Brothers.....					
Sisters.....					

Any consumption, insanity, constitutional or hereditary disease in the family, other than appears above—*i. e.*, among uncles or aunts? If so, state particulars.

Have any *two* members of the family, grandparents included, had consumption, cancer, paralysis or apoplexy, disease of heart or kidneys?

The Medical Examiner will please obtain from the party, as fully as possible, answers in detail. In giving cause of death, avoid all indefinite terms, as "General Debility," "Change of Life," "Fever," "Dropsy," "Exposure" or "Accident." If the word "childbirth" is used, state how long after delivery death occurred, and whether there were any symptoms of disease of the lungs.

Has the party any predisposition, either hereditary or acquired, to any constitutional diseases, such as consumption, rheumatism, syphilis, insanity, gout, scrofula?

Nutrition and Diathesis.

Any history of malaria, rheumatism, gout, syphilis, tuberculosis, scrofula, cancer, tumors, glandular swellings or dropsy? Where answers are "yes" here and below, state particulars—*i. e.*, date, duration, severity and results of the affection. Anything unfavorable in the general appearance, such as sickly aspect, or unduly full habit, or apparent proneness to fatty degeneration? Is there any evidence of former illness?

The Skin.

Any skin eruption, sores or ulcers; any history of skin disease or vestiges of the same? Has he had erysipelas, carbuncle, boils?

Nervous System.

Any history of severe headaches, vertigo, loss of consciousness, convulsions, tumors, epilepsy, delirium tremens, paralysis, apoplexy, nervous exhaustion, mental derangement or spinal disease? Any present derangement of function, or suspicion of any lesion?

ORGANS OF SPECIAL SENSE.

Any history of otorrhœa or otitis?

Any serious impairment of sight or hearing?

RESPIRATORY ORGANS.

Number of respirations per minute? Is the character of the respirations other than full, easy, distinct and regular? Is there any history of hæmoptysis or spitting of blood, chronic catarrh, hoarseness or cough, shortness of breath, asthma. bronchitis, pneumonia, pleurisy?

Is there present impairment of function, or any abnormality, discoverable by means of physical diagnosis?

BLOOD VESSELS.

What is the rate and other qualities of the pulse? Count at least a minute. Is it intermittent or irregular? If the applicant is excited, wait and secure the normal rate. Is there any indication present of any disease of the heart or blood vessels? Any abnormality discoverable by auscultation or percussion? Any history of sunstroke, faintings, palpitations or cardiac pains; of varicose veins or bleeding piles; or any suspicion of atheroma or aneurism?

ALIMENTARY CANAL.

Any history of difficulty in swallowing, dyspepsia, chronic diarrhœa or dysentery, constipation, colic, jaundice or liver disorder, fistula in ano?

Any present impairment of function or trace of organic disease?

URINARY ORGANS.

Specific gravity and reaction of the urine? The Examiner must have personal knowledge that the urine was voided by the applicant. Does it contain albumen? Employ the most accurate tests. Sugar? Examine for sugar carefully when the specific gravity is over 1.025. Color and appearance of urine? Frequency of micturition? Quantity voided in the twenty-four hours? Nature and amount of sediment?

Microscopical examination. Any casts? Blood? Pus? Crystals? Other elements? The microscopical examination is omitted unless required by the company in special cases, or when the policy is for an extraordinary amount.

Is there any history of gravel, calculus, cystitis, nephritis, dropsy, diabetes?

ORGANS OF GENERATION.

Any history of venereal disease, stricture, prostatitis, enlarged prostate? *Females.*—Any menstrual disorder, history of uterine or ovarian disease, abortion or difficult labors? Is applicant now pregnant? Has she borne children; if so, how recently? Has she passed the climacteric?

GENERAL HEALTH RECORD.

Any history of serious illness, injury or deformity, not alluded to above? Are you satisfied that there is nothing in his physical condition, habits, personal or family history, not distinctly set forth, tending to shorten life? Is the applicant insured in this or any other companies? Has any proposition, negotiation or examination for life insurance been made in this or any other company or association, on which a policy has *not* been issued; if so, when and in what company?

Has applicant had smallpox or varioloid? Date of successful vaccination? Does scar exist?

PERSONAL HABITS.

Does he drink wine, spirits or malt liquors daily or habitually? If so, to what extent? Former habit of drinking intoxicating beverages? Does he now or has he ever used opium, chloral, tobacco, or other narcotics? Does he use tobacco to excess?

Are there any evidences of impaired health or constitution from the use of stimulants or narcotics?

MEDICAL ADVISER, ETC.

Name and address of applicant's regular physician; or, if there be none such, that of the physician last consulted, with the nature of the illness. Does the applicant expressly waive all provisions of law forbidding any physician who has attended him from disclosing all information thereby acquired? Do you desire any information from his medical adviser; if so, procure and submit it with this report.

Name and residence of an intimate friend, who may be referred to for information.

REMARKS.

(Here note any circumstances affecting the risk which do not appear in the foregoing answers.)

OPINION.

Compared with the average of lives of the same age and sex, does the "expectation of life" in this applicant seem to you "first class" or "fair" only, or "doubtful," or "bad?" If you were yourself in the business, would you grant this subject a life policy? (Answer conscientiously, independent of set rules and instructions; your own, honest, individual opinion is what is wanted.) If not for life, for what term of years would you issue a policy?

SIGNATURES, ETC.

Append the signatures and addresses of both applicant and Medical Examiner, with exact dates.

ADDITIONAL FEMALE CERTIFICATE.

In case the candidate is a woman, the following additional questions are required:

Name? Residence? Is she well formed; and do her weight, height and general appearance indicate a healthy person? Is she now pregnant? Are the functions of the uterine system in a healthy condition? Is any disease of the breast suspected; if so, what? Has she ever had prolapsus uteri, ovarian disease, or any disease of the genito-urinary organs? Are there tumors suspected in the womb or other part of the body? Has she ever miscarried? If so, how many times and under what circumstances? If she has borne children, how many, and were the labors natural and without serious results? Are you acquainted with any facts affecting her health not included in the above questions? Do you consider her safely insurable and recommend that a policy of insurance be granted? Date. Signatures.

(Agents' Report and Instructions to Agents, see Appendix.)

INSTRUCTIONS TO MEDICAL EXAMINERS.

(Revised from the rules observed by the prominent companies.)

GENERAL RULES.

1. The company's latest issue of blank form of application must be used in all cases. Examine it carefully, and see that every question is correctly and definitely answered.

2. Conduct your examination in private, and not in the presence of the agent, or of others; except in the case of females, when it is often prudent to have your own witness present.

3. Applicants must be examined in the places where they reside or do business, unless otherwise desirable, and by the Examiner regularly appointed and accredited to such place. When the Medical Examiner is himself the applicant, he must be examined by another Medical Examiner regularly appointed in the same or in a neighboring place.

4. Applicants cannot be examined by Medical Examiners who are either their relatives or who may be directly or indirectly beneficiaries under the policy.

5. Make your report full and precise. Such report has to serve the Medical Directors at the home office as the basis of their professional judgment on the risk.

6. The Medical Examiner's report should be free from alterations, interlineations or erasures. When unavoidable, the same must be duly attested by the party entitled to make them, with date of such attestation.

7. Medical Examinations, to be accepted, must have been made within thirty days prior to the receipt of the application at the home office.

8. Particular attention should be paid to writing out the full name of the person examined.

9. He must date his examination the day it was made.

10. The company holds the Medical Examiner responsible for the identification of applicants, and he is instructed to make no examination unless the applicant is personally known or satisfactorily introduced to him. The same rule applies to persons presented for examination for certificates of health, which, in all cases, must be paid for by the applicant and must not be charged to the company.

11. A Medical Examiner who removes from the district to which he has been accredited forfeits his appointment. He may, at the discretion of the company, be reappointed for the district to which he has removed, provided there is a vacancy at that point.

12. An Examiner who signs as witness to an applicant's signature should state the reason therefor, and whether he has any interest in the transaction.

13. The home office expects the Examiner to notify it in every case where a policyholder may be violating the terms of the policy by vicious habits, or otherwise in any way tending to shorten life. Thus unjust claims may be avoided.

14. The Examiner should report any local cause of disease, which makes a particular residence unhealthy, and also whether there is anything in the occupation rendering life insecure. Persons not infrequently change their residence and business for sanitary reasons. Such reasons must be investigated.

15. If the applicant has ever applied, or been examined, for life insurance, and no policy issued, explanation of the reason for such non-issue of policy must be given, with date of rejection and name of company.

16. A Medical Examiner may solicit applications for insurance, and participate in the commissions accruing therefrom under the rules of each company, but he must, in every such instance, submit the applicant to another regularly appointed Examiner for examination. It is manifestly improper that he should act as Examiner and agent at the same time.

17. Where the application is from $20,000 to $30,000 or over, the applicant must be examined by two regular Examiners. Two large companies require three Examiners for amounts over $50,000.

18. The Medical Examiner's relation to the applicant for life insurance is opposite to that which he occupies in his professional capacity. In the latter case the patient exposes his infirmities, and even intensifies them; the applicant for life insurance, on the other hand, may desire to lessen their importance or conceal their existence.

19. The Medical Examiner is the guardian of the interests of the company. He is expected to furnish the company, on its appropriate blanks, an explicit and truthful statement of the age and physical condition of the

person proposed for insurance, and to revise the statements made in the application, with a view of demonstrating their correctness. For this reason he receives a fee, whether the applicant be accepted or rejected.

20. He should be careful to give a clear statement of the circumstances appertaining to each case. If any disease or disorder has occurred, name it specifically, avoiding such phrases as "urinary trouble," "kidney difficulty," "throat disorder," "complications," etc. These terms, conveying no precise information, produce an unfavorable impression as to the risk, and cause additional correspondence and delay.

PHYSIQUE.

1. In the matter of physical examination be thorough, no matter how sound the candidate may appear, nor how well you may know him.

2. The Examiner should notice whether the age given corresponds with the appearance of the person, and when marks of premature decay are present, should report them. He should also notice whether the person be erect, well-formed and of healthful aspect, and whether the height be in proportion to the weight.

3. If the applicant be over the standard weight, state whether it is caused by fat or by development of bone and muscles, and whether the party is of an active or sedentary habit. If under weight, it is important to know whether the tissues are firm and healthy, or otherwise. In either case, find out if the peculiarity is or is not a family characteristic.

4. Defects of vision or hearing may be of serious import, either themselves impairing the risk or indicating disease of vital organs.

5. Any injury, mutilation or deformity must be reported.

HEREDITARY INFLUENCES.

1. The family record is often carelessly reported, and the frequency with which parents, brothers or sisters die of "old age," "exposure," "child birth," "change of life," "don't know," and similar ambiguous causes of death, has made each company desirous of getting specific information, unembarrassed by vague or unscientific terms, upon these vital points. Try to elicit the specific disease causing death, especially when there may be a suspicion of consumption. State whether phthisis was or was not an element of a fatal illness.

2. In some cases the applicant may really be ignorant of the exact ages or causes of death in the case of near relatives. If so, state the facts plainly.

3. Predisposition to disease is regarded under two aspects:

First. When the family history is such that the person may be considered predisposed to the disease of which his parents died—as, for instance, when the death of both was caused by consumption, insanity or so-called scrofulous disease.

Second. When one parent and a number of brothers and sisters, or other relatives, have so died, conjoined with personal traces of the disease.

4. The cases where one parent has died of a disease, the predisposition to which in the offspring may be hereditary, the person, by reason of age, conformation, health and occupation, with an affinity to the healthy parent, may be fairly entitled to a limited form of policy.

5. Observe, also, hereditary or acquired tendencies to other diseases, especially rheumatism, heart disease, gout, cancer, kidney disease, insanity, syphilis, paralysis, apoplexy and nervous diseases, and furthermore, the general family tendency to longevity or early deaths.

GENERAL HEALTH RECORD.

1. In the matter of personal history, ask specifically the questions necessary to cover the points of inquiry called for by the blank form, and do not accept in reply any general negative—such as, "Oh, I have never been sick." Many occurrences bearing on assurability, but which do not constitute serious disease, such as an hæmoptysis, an otorrhœa, a fistula, or a stricture, are often forgotten by candidates until specifically inquired about.

2. A direct question should be asked, embracing all such diseases as may be omitted in the form, or known to the applicant by other names. Many diseases, like malarial and typhoid fevers, may leave serious impressions on the constitution, or, on the contrary, may tend to improve the risk.

3. In many instances, predisposition to disease may be acquired from habits of life, occupation, exposure, accidents, unhealthy residence, previous attacks of disease, etc. It is the duty of the Medical Examiner to make a close examination of all the facts bearing upon such cases, or to state in the application, or in a private letter, to the medical officers, such modifying circumstances.

PERSONAL HABITS.

1. The regular or occasional use of intoxicating liquors, tobacco or narcotics needs special investigation, as experience has proved that habits of drinking and the use of narcotics have more influence in determining the probability of life than any other adverse factor in the problem of life insurance.

2. The applicant's habits of using alcoholic stimulants, opium, tobacco, etc., should be definitely ascertained, and in stating them in your report, avoid the use of such words as "moderate," "occasional" and "temperate." Where their daily or frequent use is suspected, assure yourself that the stomach, liver, kidneys and nervous system are free from evidences of injury.

3. In the matter of habitual indulgence in alcoholics, report specifically what the candidate drinks, and how much. In reporting over-indulgence, draw the line at Anstie's limit of a daily allowance equivalent to one and a half ounces of absolute alcohol. Such allowance will be represented by three ounces of ardent spirits; two wineglassfuls of sherry or strong wine;

a pint of claret, champagne or other light wine; three glasses of strong ale or porter, and four or five glasses of light ale or lager beer. In cases of excess indicate it clearly.

BLOOD VESSELS.

1. It is better to rate the pulse in the sitting posture and note its qualities, before further examination shall have excited the circulation.

2. It often happens that, from exercise or the taking of food or stimulants just previous to the examination, the pulse becomes rapid, unsteady or even intermittent. The use of tobacco, strong coffee, tea, or the loss of a night's rest, will sometimes produce the same results. Always postpone such cases for subsequent examination, when, the cause being removed, the circulation may be found normal. In case frequency alone be the objection, by prolonging the interview and diverting the applicant's mind from the immediate subject in hand, the pulse will become fuller, and its frequency decrease.

3. The exploration of the chest, for the detection of possible incipient disease of the heart, must be critical. Never be satisfied with the absence of abnormal sounds, but be positive of the presence of normal conditions.

RESPIRATORY ORGANS.

1. The Examiner should exercise great care in his exploration of the thorax, remembering that he has probably only to detect the first symptoms of thoracic disease. No examination can be satisfactory that is made through the clothing; the chest must in all cases be exposed, or at least only covered by the undergarment.

2. The history of an attack of hæmoptysis should not be looked upon as accidental, unless distinctly coincident with some injury inflicted, or some violent physical effort made at the time. It is often stated that the bleeding came from the gums or throat; but the presumption is always against this origin, and it must be proved to the satisfaction of the Examiner before the risk is approved.

3. The following table exhibits the proper average relation of height, weight and chest measurement:

HEIGHT.	Weight—Pounds.	Medium Chest.	HEIGHT.	Weight—Pounds.	Medium Chest.
5 feet, 1 inch.....	120	34.06	5 feet, 7 inches.....	145	38.16
5 " 2 "	125	35.13	5 " 8 "	148	38.53
5 " 3 "	130	35.70	5 " 9 "	155	39.10
5 " 4 "	135	36.26	5 " 10 "	160	39 66
5 " 5 "	140	36.33	5 " 11 "	165	40.23
5 " 6 "	143	37.50	6 " .. "	170	40.80

Note great excess of weight, or the opposite, especially whether it has been recently or rapidly acquired or lost.

4. The chest measurement should be taken by adjusting the tape under the vest, between the second and third ribs anteriorly, and below the lower border of the scapulæ posteriorly. The respiratory expansion should be at least from one and one-half to two inches.

ALIMENTARY CANAL.

1. Dyspepsia is sometimes a prelude to consumption or organic disease of the stomach, liver or kidneys. Its nature should in all cases be inquired into and reported upon.

URINARY AND GENERATIVE ORGANS.

1. Symptoms of disease of the urinary organs (stricture, enlargement of the prostrate gland, stone, etc.) should be carefully investigated.

EXAMINATION OF URINE.

1. The urine should always be voided in the presence of the Examiner or at the time of examination. It must be examined in all cases for albumen and its specific gravity taken. Unless the specific gravity exceeds 1.025, no test for sugar need be made.

2. The urine of applicants for insurance of $30,000 and over must be examined microscopically as well as chemically. Other microscopical examination need not be made unless specially required by the home office.

3. One great company directs as follows:

"In the matter of testing the urine, so apply your tests as to detect the presence of even small amounts of albumen or of sugar. For such detection of albumen, the common heat and nitric acid test is efficient enough if applied in the following manner: First acidify with a drop or two of acetic acid, then fill a long test tube three-quarters full and, holding the same by the bottom, boil the upper portion, only, of its contents. Holding the tube now a few inches in front of a black background set before a window, compare the upper, boiled, stratum of fluid with the lower unboiled one, and any pathologically important amount of albumen will be shown by a distinct cloudiness of the upper stratum of urine, distinguishable from the cloudiness of precipitated phosphates by its persistence after addition of a drop of nitric acid. As regards sugar, test for this constituent in all cases, regardless of specific gravities. In the beginning of diabetes, as in temporary glycosuria, the amount of glucose in the urine is commonly not enough to run the specific gravity out of bounds. Take by preference, furthermore, the urine secreted during active digestion, since in the beginnings of both albuminuria and glycosuria, the morbid constituents may be present during digestion while absent in the intervals."

4. Another one gives the following excellent hints:

"Be sure that the urine is that of the applicant, and examine it within twenty-four hours after it is voided. After noting the color, reaction and specific gravity, fill a clean test tube half full of the clear urine (previously filtered, if turbid), and holding it at an angle of forty-five degrees, allow nitric acid to trickle gently down its side and form a stratum, under the urine, at the bottom of the tube. If carefully done, the two fluids will not mingle. Should any hazy or whitish cloud be observed at the point where the urine and acid meet, apply heat, and if the cloud remains, albumen may be considered present.*

"It is important to hold the test-tube in a proper light in order to distinguish slight changes, where only a small amount of albumen is present. The best way is that advised by Dr. John Munn, viz.: Place some dark material over the lower part of the window, as a background, and draw the shade down to it. Now, holding the test-tube a little way from this background, lift the shade forward enough to allow the rays of light to pass through the tube without shining into your eyes. In such a light and against the dark background, very slight opacity becomes visible.

"To detect sugar: fill a clean test-tube to the depth of half an inch with Fehling's standard test solution and boil it. If it is pure and reliable, it will remain clear and of a dark blue color. While the clear solution is hot, add the urine a few drops at a time. Sugar will cause a deep yellow or orange colored precipitate before the amount of urine added equals the quantity of test solution employed. If there is no change, once more heat to boiling and stand it one side. When cool, if there is no change, sugar may be considered absent. Squibb's Fehling's Test Solution is reliable and can be obtained through any druggist.

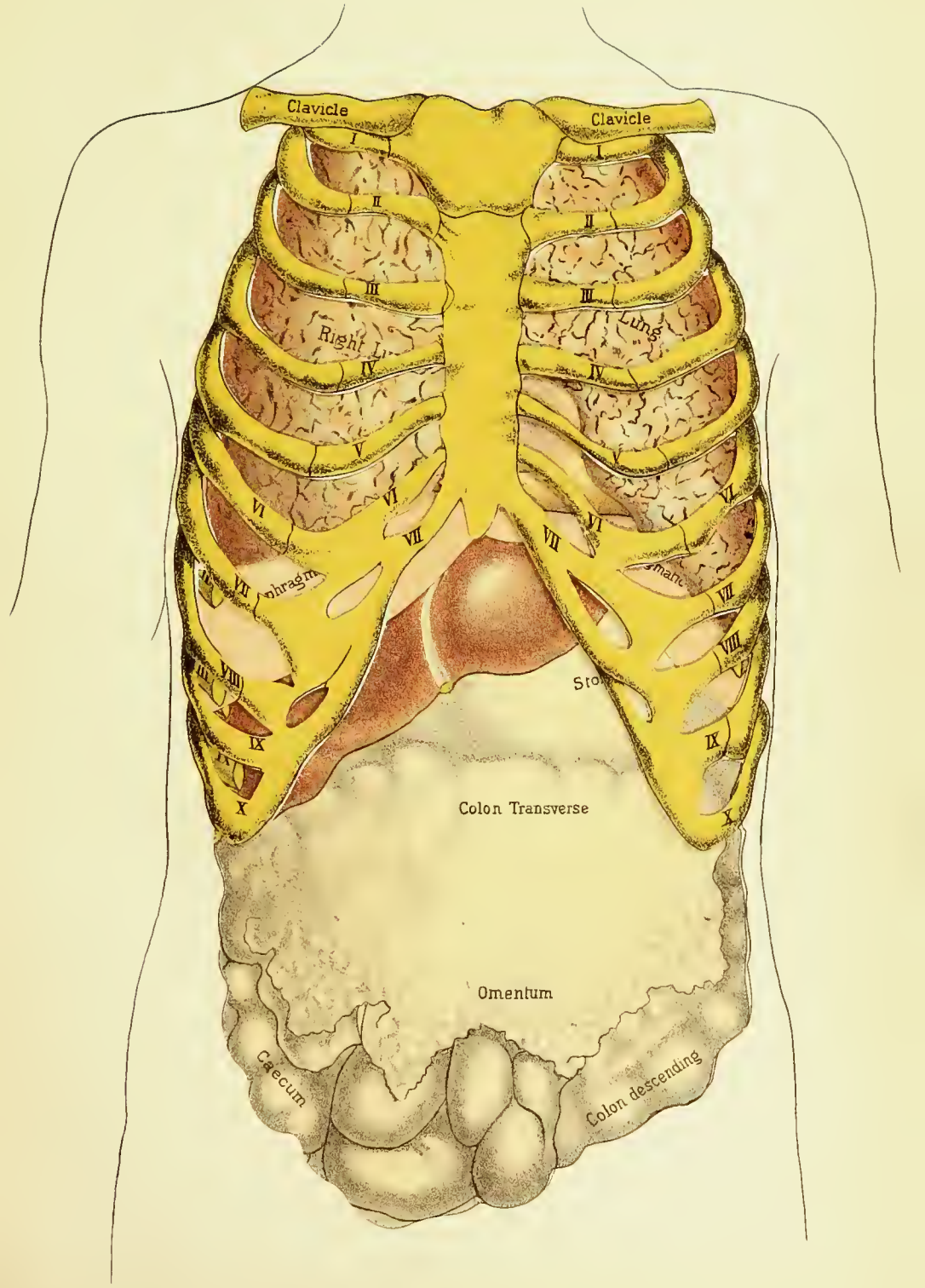
"When the specific gravity is above or below normal, or albumen or sugar are present in very small quantity, it will be well to collect the total secretion of twenty-four hours and examine a sample of this mixed urine.

"The microscope should always be used when, in a case otherwise acceptable, there is a suspicion of disease requiring its aid for certainty, as where there is a history of calculus or cystitis."

MEDICAL ADVISER.

1. If information as to the present or past condition of the applicant be deemed necessary, it is desired that the Examiner procure it from the applicant's attending physician in a professional way, with the understanding that it will be treated as confidential by the company. Such information should be paid for by the Examiner as a regular office fee, and the

* NOTE.—Urine containing resinous matters, as when a patient is taking turpentine, balsam copaiva, etc., will sometimes give a whitish-yellow cloudiness, similar to albumen, with nitric and hydrochloric acids. The addition of alcohol will cause this to disappear at once.


Clavicle
Clavicle
I
II
III
Right L
Lung
IV
V
VI
VII
VII
VIII
IX
X
Colon Transverse
Omentum
Caecum
Colon descending

amount thus paid communicated in a private letter to the medical officers, who will cause it to be refunded.

CONFIDENTIAL.

1. If, for any reason, the Examiner does not wish to present in the application certain specific facts disclosed by the examination, he must write a confidential letter to the Medical Department at the home office, detailing such information. In this way nothing of importance affecting the risk need be withheld from the home office.

2. If so requested by the candidate, for the purpose of holding private his medical history, you are authorized to deliver to the agent your report sealed.

3. In the event of your giving an adverse opinion upon a risk, or of your declining to examine a candidate because of foreknowledge of his ineligibility, you are particularly requested to communicate the fact confidentially, stating name, residence and occupation of the objectionable candidate, date of your unfavorable action and reason for the same.

POSTPONEMENT OR DECLINATION.

1. Whenever a Medical Examiner postpones or declines an application, he will please write a confidential letter to the Medical Department of the home office at once, giving the person's name, age, occupation and the reason for his action.

2. If the applicant has suffered from any recent severe attack of illness, postpone his acceptance until a sufficient time shall have elapsed to show his restoration to firm health.

MEDICAL EXAMINER'S OPINION.

1. In forming your opinion of the life as an assurance risk, remember that the question is not merely the narrow one of whether or not the candidate is, at the moment, healthy and sound, but is the broader subject of his chances of living—chances that may be affected as much by abode, occupation, habits of life and hereditary tendencies as by present condition of health. A wise judgment, therefore, requires the weighing of all the influences now or prospectively affecting the life.

CAUSES OF REJECTION.

1. Considering them especially hazardous risks, one of the largest companies in the world will not insure any of the following classes of applicants: Gamblers, bar-keepers, hotel proprietors who tend their own bars, keepers of saloons where liquors are sold, billiard-room keepers, any retailer of alcoholic drinks or one personally engaged in their manufacture; miners, day laborers, engineers and firemen either of stationary or moving engines; men employed on any railroad train, or in switching or coupling cars; men in

blast furnaces, powder mills, fireworks or nitro-glycerine manufactories; balloonists, ordinary seamen, men operating in steam mills or near circular saws; divers or submarine workers of any kind.

2. Another great company prints the following causes:

"1. When both parents have died of consumption.

"2. When one parent (or two members, not parents) died of consumption, which parent the applicant more closely resembles, unless the family history is otherwise unexceptionable, the applicant himself possessed of healthy conformation, and has reached the age of at least thirty-five years.

"3. If the applicant has raised blood, he is not at all insurable until after ten years, and then only in favorable cases, and for short endowments (except where it can be positively proved that the blood did not come from the lungs or air passages, in which case the home office will decide).

"4. Where the party has been afflicted with paralysis, epilepsy, hereditary insanity, or symptoms denoting softening of the brain.

"5. If any of the preceding diseases have occurred in any two members of the applicant's family, he is to be regarded as insurable only upon the endowment plan, the term of insurance to expire prior to his reaching the age of fifty years.

"6. Intermission or irregularity of the pulse or heart's action, abnormal sounds of this organ, habitual cough, difficulty of breathing, and asthma.

"7. Diseases of the digestive organs materially affecting the health of applicant.

"8. Gout, fistula, irreducible hernia, frequent attacks of erysipelas or of colic, the existence of an open ulcer, disease of the spine, important tumors, and inflammatory rheumatism.

"9. Diseases of the urinary organs."

FEMALE APPLICANTS.

1. If the applicant is a woman, ascertain whether the functions of the reproductive system are normal.

2. Owing probably to the difficulty of ascertaining the peculiar physical history of women in their applications, the experience of life insurance companies is that they have not generally proved to be profitable risks. Consequently, it is necessary to make their physical examination with the greatest care.

3. In cases of pregnancy, postpone the application until a sufficient time has elapsed after delivery to indicate that the woman's constitution has not been affected.

RULES GOVERNING PROOFS OF DEATH.

1. Specific information concerning the late habits of deceased, in regard to the use of alcoholics and narcotics, must be furnished; and also the occupation must be fully stated.

2. When death is caused by disease of the brain or from insanity, give the full particulars as to the cause and duration of the same.

3. In case of suicide—a certified copy of the evidence and verdict of the coroner is required; and in all cases of sudden death from unknown causes, the particulars and results of all investigations held must be sent to the company.

4. Certificates of the disease causing death must be furnished by the attending and consulting physician.

5. Every question must be distinctly and fully answered. The company reserves the right to ask additional questions when necessary.

FEES OF MEDICAL EXAMINERS.

1. The fee for examination, allowed by the company, in each case will be paid by the agent, and should be receipted for on the company's blank. But should the application be for less than $1000, the fee must be paid by the applicant.

2. The additional fee for a microscopical examination of urine—where required by the foregoing rules—will be the same as that allowed for by the physical examination of the applicant.

3. When examinations by two physicians are required (as in the case of a risk for $30,000 or over), but one microscopic examination shall be made, for which but one fee will be allowed as per rule.

4. But one fee will be allowed for any number of examinations of the same applicant made within thirty days.

5. Medical Examiners will be paid only the regular fee for examinations. All extra charges, as for transportation, or going unusual distances, must be paid by the agent.

6. Each company declines to pay for the examination of any applicant whose occupation is described in the foregoing rules as especially hazardous. The Medical Examiner must look to the agent for his compensation where the applicant is so excluded

7. Bills for medical examination must be presented at the end of the current month.

PART II.

EXAMINATION OF THE APPLICANT.

IDENTIFICATION.

Signature.

Name and Identification.—Although it is stated that the name identifies the applicant, when he is not personally known to the Medical Examiner, the agent presenting him for insurance, or some other witness, should be held responsible for his identification. Carelessness in this respect has often subjected insurance companies to fraud, which might have been averted by care on the part of the Examiner.

ENVIRONMENT.

Occupation.

We append at the close of this paragraph a table showing a classification of the relative influence of the various occupations on the duration of life in general, but it must be the task of the Examiner to determine, in each individual case, how far the applicant's particular employment is likely to prove prejudicial to longevity, in view of what is elicited by the insurance examination. One man may be so constituted as to bear with impunity a routine of life which would probably prove fatal to another. Statistics establish the general principles, to which individual exceptions can be taken, either in favor of or against the applicant.

In some occupations danger of accidents must be considered; in others, the general deleterious circumstances. A person below par in the scale of respiratory or circulatory power, may be safely insurable, provided his pecuniary means and occupation admit of the likelihood that he will take the requisite care of himself, thus neutralizing the risk.

To the well-to-do merchant or professional man, an occasional attack of catarrh or bronchitis need not excite alarm, while the same ailment in a person whose occupation constantly furnished the exciting cause of such attacks, might suggest the possibility of eventual chronic disease.

Professional Men.—Among this class, *teachers* show the greatest longevity; but it is fair to admit that few occupations suffer from worse atmospheric conditions than those members of this class, who, as *under-teach-*

ers in city schools, work up to the highest pitch of mental exertion, for six or eight hours a day, in poorly ventilated school-rooms, over-crowded with uncleanly children. Their standard of health is low, compared with the great majority of principals in high schools, and teachers in colleges and country schools, who reach the greatest age.

Clergymen rank next, being subject to few diseases, except those resulting from a sedentary life. They suffer most from dyspepsia, and are not more liable to pulmonary complaints than the followers of other pursuits. *Lawyers* are classed next; then professional *lecturers*, and then *physicians*. Physicians, as a class, owing to exposure and irregular habits, suffer a subtraction of one-fourth from the highest expectation of life; but in individual cases this does not apply.

City and Country.—In regard to physicians, it may be said that the country doctor, on account of necessary hardships, is a less favorable risk than his city brother. Concerning the other professions, the general standard of health is about the same in the city as it is in the country, notwithstanding the fact that the latter undoubtedly offers greater natural advantages for the enjoyment of health. What the city lacks in certain respects is made up by the more general observance of sanitary requirements in the matter of dwellings, sewage, dirt, dress, exercise, personal cleanliness, the timely heeding of professional advice, etc.

ARTISTS.—*Picture painters*, who spend much time out of doors, and *sculptors*, who model but do not chisel the marble themselves, are classed next to professional men, and prove better risks than those of the same craft who paint and fashion the stone in studios. *Photographers* rank second class.

ARTISANS AND MECHANICS.—Painters, using lead, turpentine and oils, require careful scrutiny before they can safely be admitted. For their case, outside work in the fresh air is preferable to indoor work, and the constitution and physical status must be sound.

Workers in *phosphorus* and *quicksilver* present the same objections. *Stone-cutters*, *millers*, and those engaged in similar occupations, which necessitate constant breathing of air laden with irritating particles, are questionable risks, unless the applicant is exceptionally strong and careful, and his place of business is provided with improved methods of ventilation. *Glass-blowers* and *type-setters* are indifferent risks, both on account of bad air and bad habits. *Blacksmiths*, *furnace-men*, *carpenters*, *coopers* and *cabinet-makers* are among those engaged in the more healthy pursuits. *Shoemakers* and *harness-makers*, being more sedentary in their habits, rank second class, as do *tailors*. *Butchers* and *marketmen*, aside from their liability to accidents, are first class. *Machinists*, *plumbers*, *tinsmiths*, *tallow chandlers* and *barbers*, etc., are average risks. *Engravers*, *jewelers* and the like, suffer from lack of exercise, but are in other respects unobjectionable. *Brewers*, *confectioners*, *dyers*, *hatters*, *bakers*, *bath attendants*, and others who are subject to sudden changes of temper-

ature, from hot to cold, and wet to dry, are not desirable as a rule. *Chemists, assayers, gilders, tobacconists*, etc., come under the same head. *Day laborers*, unless exposed to accidents, are good risks. *Farm laborers* in healthy localities are among the best risks.

ACCIDENTS.—Among *sailors*, thirty-five per cent of the deaths are due to accident, but they enjoy greater immunity from sickness than the population at large. For *miners*, the ratio is twenty-five per cent; *engineers* and assistants, fifteen per cent; *painters*, *plumbers* and *glaziers*, ten per cent.

ARMY AND NAVY.—The recruit, after he has passed the rigid examination and is admitted to the service, should be considered above the average risk.

The diseases to which he is most exposed in the army or navy, are malarial and typhoid fevers, rubeola, diarrhœa, dysentery, rheumatism, scurvy, pneumonia, catarrh, heart disease, Bright's disease and venereal affections. A careful examination is requisite, because these applicants undergo severe hardships from the exposures and exigencies of the service, which are liable to induce organic diseases.

PREVIOUS EMPLOYMENT.—While the present occupation may be salutary, the previous employment may have left traces of serious disease, which should be recognized.

THE BEST LIVES are those exposed sufficiently to the fresh air, and supplied with moderate physical exercise, combined with variation enough to maintain the fund of interest in living. Under proper protection, the change of seasons in the temperate zone is conducive to health and long life.

CLASSIFICATION OF RISKS ACCORDING TO OCCUPATION.

CLASS I.

Brakemen on freight trains.
Buzz sawyer.
Circular sawyer.
Powder maker.
Seamen.

CLASS II.

Bridge builder.
Boatman.
Barber on steamboat.
Brakemen on mail trains.
Cartridge maker.
Clerk on river steamboat.
Captain of lake or sea vessel.
Car coupler.
Conductor on freight trains.
Cooper.
Dock laborer.
Engineer on river steamer.
Furrier.
Fireworks, maker of.
Fireman, locomotive.
Grinder of edged tools.
Horseshoer.
Laborer, wharf, warehouse, grain elevator.
Lighterman.
Lumberman.
Master or mate of vessel.
Match maker.
Mail agent, traveling.
Mate of river steamer.
Miner, underground.
Nightman.
Pilot.
Quarrier.
Quarryman.
Raftsman.
Railroad engineer.
Race horseman.
Sailor.
Steward of steamboat.
Switchman.
Stevedore.
Slater.
Steel polisher.
Telegraph builder.
Timber cutter.
Train starter.
Wood carver and turner.
Yard master.

CLASS III.

Agricultural implement maker.
Barkeeper.
Blacksmith (working).
Blast furnace (working in).
Block, oar and mast maker.
Boiler maker.
Bolt maker.
Brass founder (working).
Bricklayer.
Broker in cattle and horses.
Baggage master on trains.
Baggage master at station.
Canal boatman.
Captain on river steamer.
Car driver.
Carman (drayman).
Carpenter and joiner.
Caulker (ship).
Coachman.
Cork cutter.
Cooper.
Coal heaver.
Carpenter (railroad).
Chief engineer,
Car repairer.
Car cleaner.
Conductor on passenger trains.
Distiller.
Driver of express wagon.
Drover.
Detective (railroad).
Express agent (not on trains).
Express agent on trains.
Engineer on stationary engine.
Express messenger on trains.
Foundry (employee in).
Fireman (engine, hose, hook and ladder).
Freight agent (station).
Freight laborer.
Hod carrier.
Horse breaker.
Hostler.
Inspector of wood and timber.
Knife and instrument maker.
Lead pipe and tube maker.
Lighthouse or lightship keeper.
Lightning rods (one who puts up).
Livery stable keeper.
Lumberman, manufacturer.
Laborer, common.
Locomotive superintendent.
Limestone quarrier or burner.
Master mechanic.
Mason.
Machinist.
Metal turner.
Miner (surface).
Naval architect.
Operative in saw and planing mill.
Painter.
Prison office keeper.
Puddler.
Rolling mills.
Saw mill (employee).
Shooting gallery keeper.
Scythe and sickle maker.
Ship carpenter.
Shipsmith.
Slate quarrier.
Stable keeper.
Stage driver.
Sugar refinery (workman in).
Station man.
Signal man.
Ship inspector.
Stone cutter and dresser.
Track laborer.
Track superintendent.
Track foreman.
Track inspector.
Teamster.
Turpentine manufacturer.
Watchman.
Wood chopper.

CLASS IV.

Actor, actress.
Ale or beer manufacturer.
Apothecary, druggist.
Architect.
Armorer.
Artificial limb maker.
Actuary.
Artist, painter.
Attorney, lawyer.
Auditor.
Army or navy officer (not in service).
Author, writer.
Bookseller.
Broker in mdse., stocks or gold.
Bank officer or clerk.
Bookkeeper, accountant.
Baker.
Barber.
Basket-maker.
Bell-hanger.
Boat builder
Bookbinder.
Boot and shoe maker.
Box and trunk maker.
Brass polisher, finisher.
Brewer.
Brickmaker.
Builder, not laborer.
Cabinet maker.
Cap or carpet-bag maker.
Carpet weaver.
Chair maker.
Chemist and druggist.
Chiropodist.
Civil engineer.
Clock maker.
Coach maker.
Coffee-house keeper.
Commercial agent.
Clergyman, minister.
Clerk (generally).
Clothier.
Commission merchant.
Captain of lake or sea steamer.
Chemist, manufacturing.
Coal miner (underground).
Confectioner.
Cook (professional).
Coppersmith.
Copperplate printer.
Cornice moulder.
Cotton dyer.
Cotton packer and presser.
Cotton printer.
Cow-keeper, milk seller.
Currier.
Custom-house officer.
Cutler.
Draughtsman.

CLASS IV.—*Continued.*

Dressmaker.
Dentist.
Die engraver, mould maker.
Drug Grinder.
Eating-house keeper.
Embosser.
Embroiderer.
Engraver
Editor, reporter.
Engineer, mining
Fisherman.
Farmer, owner.
Farm laborer.
File maker.
Fish curer.
Fish and oyster dealer.
Furrier.
Gardener.
Gas fitter.
Gas works, service.
Gauger.
General trader (traveling).
Glazier.
Glover.
Gold beater.
Glass blower.
Gold or silver refiner and worker.
Grocer (general).
Grain measurer.
General trader, storekeeper.
Grave digger, sexton.
Gunsmith.
Harness maker, saddler.
Hat and cap maker.
Hollow ware maker.
Hoop maker.
Hoop skirt maker.
Hotel or tavern keeper (country).
House decorator.
Huckster.
Hotel keeper, proprietor.
Insurance officer and clerks (not traveling).
Ivory cutter and worker.
India rubber manufactory, employee in.
Ink maker.
Instrument case maker.
Japanner.
Jeweler, worker.
Lithographer (not working).
Leather dyer.
Locksmith.
Looking glass maker.
Last maker.
Machinist, not in employ of railroad.
Marble cutter.
Marble mason.
Marketman.
Medical student.
Metal refiner.
Miller, grain and flour.
Morocco dresser.
Millwright.
Manufacturer (not working).
Milliner.
Musician
Moulder.
Naval officer, in service.
Nail maker
Nurseryman, working.
Oil dealer, petroleum.
Operative in cotton or woolen mills.
Organ builder.
Oyster dealer.
Phonographer.
Photographer.
Physician.
Postmaster.
P. O. Clerk (not traveling).
Packer of hay, cotton, pork, beef.
Packing case maker (not using circular saw).
Painter, house, ornamental.
Paper hanger.
Paper box maker.
Pastry cook.
Pawnbroker.
Pencil maker.
Picture frame maker.
Percussion cap maker.
Plasterer.
Plater.
Plumber.
Porter.
Potter.
Pressman.
Printer, compositor.
Pump maker.
President or secretary of corporation.
Publisher.
Purser, steamship.
Policeman.
Railroad employees.
Rectifier.
Rope maker.
Surgeon.
Ship rigger.
Soap boiler.
Sail maker.
Saloon keeper.
Sausage maker.
Segar maker.
Scourer, dyer.
Ship broker, agent.
Ship builder, contractor.
Steward on vessel or steamer.
Smelter.
Soda water manufacturer.
Shovel maker.
Silversmith.
Spindle maker.
Spring maker.
Steel pen maker.
Stereotyper.
Surgical instrument maker.
Surveyor.
Tanner.
Tinman, tinker.
Traveling agent.
Type founder.
Tailor.
Teacher.
Telegraph operator.
Tool maker.
Turner, wood or ivory.
Umbrella maker.
Upholsterer.
Varnish maker.
Vitriol manufacturer.
Watchmaker.
Weighing machine, scale maker.
Wharfinger.
Wheelright.
Whipmaker.
Whitesmith.
Wigmaker.
Wire maker.
Wood dealer.
Watchman.
Weaver.
Weigher.

CLIMATE.

The influence of a change of climate in increasing or decreasing the life expectation should always be regarded by the Insurance Examiner; and the past or future effects of this element in the risk should be carefully ascertained and calculated. This subject is deserving of more attention from insurance authorities.

The most healthful climate lies between the thirtieth and fiftieth parallels of latitude, and the best insurance risks are found among the inhabitants of this zone.

The temperature of Europe, within equal parallels, is higher than that of America, and the diseases of lower climates prevail in higher latitudes on the Continent.

Acclimation is the term used to express a certain change of constitution, which inures the animal system against the liability to contract acute diseases or endemics prevalent in certain localities.

Excessive meteorological changes, as indicated by the thermometer, barometer and hygrometer, subject those inhabiting such places to various diseases, and thus tend to impair risks.

Moist and warm climates predispose to malarious affections; cold, variable and moist, to the consumptive cachexia; dry and variable, to rheumatic and inflammatory diseases.

A change from North to South is apt to derange the functions of the skin, liver, spleen and intestines by necessitating increased activity of those organs, which may lead to organic or malarious diseases. If the action of the skin becomes sluggish, the acute or chronic diarrhœa of hot climates may ensue. In other cases we observe symptoms of ague, jaundice and dropsy—it may be exhibited in the same person—such as the dark yellow complexion, distorted features, livid eyes and lips and a bloated abdomen.

Yellow fever is an epidemic disease, usually confined to cities and towns, and acclimation against the so-called malarious diseases does not afford immunity from it. One attack of yellow fever is supposed to protect against further infection; nevertheless the constitution is frequently impaired by its ravages, and organic disease may date from an attack of this fever; the Examiner must therefore be forewarned. Dr. Nott refers pointedly to this subject: "The citizen of the Southern town is fully acclimated to its atmosphere, but cannot spend a single night in the country without serious risk of life; nor can the squalid, liver-stricken countryman come into the city during an epidemic of yellow fever without danger of dying with black vomit."

The change from South to North may prove equally baneful. A healthy Southerner is liable to become the prey of tuberculous, kidney or inflammatory disease, unless he obeys the general laws of acclimation.

Acclimation to temperate climates, where no extreme changes occur, is an easier matter, but sudden variations of weather conduce to catarrhal affections and rheumatism.

Prevention of such climatic diseases as may chance to prevail in any locality, depends most upon a certain soundness of constitution inherent in some individuals and families, but, also, upon the scrupulous adaptation of one's life to the changed environment. As Dr. W. A. Hammond observes: "For an Englishman or an American to attempt a residence in latitude eighty degrees without changing his food, clothing and habits to conform with the change of climate, would lead to certain death. But if he studies the surrounding conditions and profits by the experiences of the natives, he soon becomes acclimated and lives in health and comfort." And the same is true of a change from cold to hot countries. The best prophylaxis against all fevers is an alert desire to keep well.

Permission to make these extreme changes should, therefore, depend upon the actual history and experience of the applicant, as referred by the Examiner to the executive officers, who may wisely grant him permission to make his permanent residence in a far Northern or Southern climate, if the facts demonstrate that he has heretofore maintained sound health under like conditions, or is a native of the climate to which he would return.

Reference should here be made to the proclivities which the different physical temperaments have for certain diseases, to be found in the section on Physique and Temperament.

Residence in city, town and country, as regards expectation of life, stands unquestionably in favor of the country, when we consider the total mortality, which is about twenty-five per cent greater in cities than towns. But among thrifty people, who live in cities and are able to insure, the superior sanitary and hygienic provisions against endemic and epidemic diseases just about counterbalance the advantages of country air and quietude.

The general influence of climate has had its specific effect in modifying the different races of mankind. The study of philology demonstrates the fact that most of the nations of modern Europe have descended from the same Aryan parents as have the inhabitants of the Indian peninsula. Climate, acting through the geological eras, has so modified them as apparently to produce different races. At the present time the Aryan races of Europe cannot rear their children in the climate of India, where their Hindoo relatives thrive and propagate their species, and ever since history began the European races have tried in vain to populate the tropical regions—but it has been shown to be impracticable—and this fact should receive due consideration from a life insurance standpoint.

PHYSIQUE.

AGE.

The question of age has an important general bearing upon the subject of life insurance, and the applicant should be carefully questioned and scrutinized on this point. It is a gauge of the vital force of the individual, and determines the amount of premium required by the company. As a general rule, persons having passed the climacteric and become confirmed in regular habits, are even more eligible, under the higher rates of insurance, than those much younger, who are more liable to casualties and sudden diseases.

DISEASES.—Different ages are liable to particular diseases. The tendency to hereditary diseases, at a certain age, may have been outgrown, or not yet reached. According to age, the tendency to disease and death is very great. One-tenth of all children born, die during the first month. In cities and towns nearly one-half die before the fifth year. Between the age of puberty and maturity, placed at twenty-five years, the respiratory and strumous diseases are especially fatal. None should be insured before puberty except at special rates.

Between puberty and maturity, the Examiner should lay extra stress upon the examination of the respiratory and glandular systems. Fevers, of the typhoid or continued varieties, are also destructive during this period. The exanthematous diseases exhaust the constitution, and favor the germination of phthisis and other strumous disorders. If rheumatism attacks a person in this decade of life, in which the sanguineous system is so active, it is apt to induce valvular disease of the heart, with its complications and sequelæ.

From the twenty-fifth to the fortieth year, the age of full maturity, the best risks are taken. In these years the applicant reaches his best physical development. Hereditary predispositions are in abeyance, and evil influences from without are more easily resisted.

In this period the personal habits and external influences require more careful scrutiny.

At the fortieth year decline begins, hereditary tendencies resume their influence and acute affections meet with less resistance, although they are not so prevalent as in the first two decades of life. The proclivity henceforth is rather toward congestions than active inflammations, and toward fatty and other degenerations, toward cardiac obstructions from morbid deposits, toward dropsies, paralyses, apoplexies, urinary diseases, etc.

The following table is taken from the reports of the Mutual Life Insurance Company, and shows the percentage of deaths, among over 5000 insured persons, from different diseases.

PERCENTAGE OF DEATHS, AGE AND DISEASES AMONG 5000 INSURED PERSONS.

DISEASES.	YEARS.					
	18 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 79
	%	%	%	%	%	%
Typhoid fever	13.93	7.28	6.36	4.09	3.51	1.57
Other zymotic diseases	11.68	13.86	12.52	11.27	6.84	7.88
Cancer	.41	.98	1.13	3.45	3.33	1.57
Other constitutional diseases	2.05	1.75	2.98	3.64	4.25	4.73
Consumption	34.22	25.06	17.43	9.18	4.62	4.73
Apoplexy	1.64	2.52	6.96	8.64	9.80	7.88
Other nervous diseases	5.94	8.96	10 40	12.00	13.86	15.75
Heart diseases	1.84	3.97	5.10	8.91	13.31	12.60
Pneumonia	4.10	6.51	7.69	8.64	9 06	11.81
Respiratory diseases	4.71	5.67	4.57	5.18	4.07	5.51
Digestive diseases	6.35	8.75	9.94	10.27	11.46	4.73
Urinary diseases	1.64	2.31	3.91	5.27	9.24	7.88
Accidents and suicides	10.25	10.50	8.42	5.91	3.70	3.15
Old age and unclassified	1.23	2.17	2.58	3.55	2.95	10.24

The foregoing table shows only the proportion of diseases as a cause of death among about 5000 of the insured, and not the actual frequency at the age given for the whole population. The latest statistics demonstrate that deaths from *consumption* are of nearly equal percentage at all ages. *Pneumonia* is also equally prevalent at all ages, but since it is more frequently fatal in advancing age, the percentage of mortality is greater then. *Casualties* are more frequent among the young, because they are more careless and more exposed to accidents in traveling and business. A tendency to *apoplexy* and *kidney diseases* seems to develop between the ages of thirty-five and forty; to *diseases of the heart*, about forty-five years.

APPARENT AGE.—There is often a marked discrepancy between the age given and the apparent age of the candidate for insurance. It is desirable that he should appear the age he assigns to himself; and while it is still more favorable if he seems younger than he really is, it is decidedly the reverse if he appears older. Some are relatively older at thirty than others at fifty. Owing to the increased respect for sanitary laws, and, perhaps, still more to the ministrations of the dentist and the barber and to the arts of the toilet, it is becoming more and more difficult to infer the actual age from the general appearance. The Examiner must be on the lookout for those little deceptions practiced by society in the use of hair dyes, preparations for the complexion, etc.

PREMATURE OLD AGE.—Premature old age may be the result of hereditary or congenital imperfections, of previous illness, irregular or dissipated habits, overwork or exposure.

The decline of life begins at periods varying with the state of the inherited, or acquired vigor of the individual. Any exhausting influences, in the absence of actual disease, will occasion premature senility and impair the prospect of life, and such persons should rarely be insured.

As the ratios of insurance are calculated from the known prospect of life at each age, the Examiner, when asked, should feel no reluctance in advising persons of advanced age to secure insurance, provided their average health is good and the physique of the applicant is excellent.

EXPECTATION OF LIFE.—The fallacy concerning the insecurity of old lives was long ago exploded. If they have passed safely through the dangers that beset early life, have learned how to care for health, and are in good physical condition, they are entitled to insurance.

TABLE OF EXPECTATION OF LIFE.

Or average duration of life, at any age, for each individual. From the Carlisle Table of Mortality.

AGE.	Expectation.	AGE.	Expectation.	AGE.	Expectation.	AGE.	Expectation.
0	38.72	18	42.87	35	31.00	52	19.68
1	44.68	19	42.17	36	30.32	53	18.97
2	47.55	20	41.46	37	29.64	54	18.28
3	49.82	21	40.75	38	28.96	55	17.58
4	50.76	22	40.04	39	28.28	56	16.89
5	51.25	23	39.31	40	27.61	57	16.21
6	51.17	24	38.59	41	26.97	58	15.55
7	50.80	25	37.86	42	26.34	59	14.92
8	50.24	26	37.14	43	25.71	60	14.34
9	49.57	27	36.41	44	25.09	61	13.82
10	48.82	28	35.69	45	24.46	62	13.31
11	48.04	29	35.00	46	23.82	63	12.81
12	47.27	30	34.34	47	23.17	64	12.30
13	46.51	31	33.68	48	22.50	65	11.79
14	45.75	32	33.03	49	21.81	66	11.27
15	45.00	33	32.36	50	21 11	67	10.75
16	44.27	34	31.68	51	20.39	68	10.23
17	43.57						

Other tables vary this expectation from one to two per cent.

ENGLISH AND AMERICAN MORTALITY RATES.

AGE.	American Table. Number Living.	Combined Experience. Number Living.	American Table. Number Dying.	Combined Experience. Number Dying.	American Table. Expectation of Life.	Combined Experience. Expectation of Life.	English Life Table No. 3 (Males). Expectation of Life.
10	100,000	100,000	749	676	48.72	48.36	47.05
11	99,251	99,324	746	674	48.08	47.68	46.31
12	98,505	98,650	743	672	47.44	47.01	45.54
13	97,762	97,978	740	671	46.82	46.33	44.76
14	97,022	97,307	737	671	46.16	45 64	43.97
15	96,285	96,636	735	671	45.50	44.96	43 18
16	95,550	95,965	732	672	44.85	44.27	42.40
17	94,818	95,293	729	673	44.19	43.58	41.64
18	94,089	94,620	727	675	43.53	42.88	40.90
19	93,362	93,945	725	677	42.87	42.19	40.17
20	92,637	93,268	723	680	42.20	41.49	39.48
21	91,914	92,588	722	683	41.53	40.79	38.80
22	91,192	91,905	721	686	40.85	40 09	38.13
23	90.471	91,219	720	690	40.17	39.39	37.46
24	89.751	90,529	719	694	39.49	38.68	36.79
25	89.032	89,835	718	698	38.81	37.98	36.12
26	88,314	89,137	718	703	38.11	37.27	35.44
27	87,596	88,434	718	708	37.43	36.56	34.77
28	86,878	87,726	718	714	36.73	35.86	34.10
29	86,160	87,012	719	720	36.03	35.15	33.43
30	85.441	86,292	720	727	35.33	34.43	32.76
31	84.721	85,565	721	734	34.62	33.72	32.09
32	84.000	84,831	723	742	33.92	33.01	31.42
33	83.277	84.089	726	750	33.21	32.30	30.74
34	82.551	83 339	729	758	32.50	31.58	30.07
35	81,822	82 581	732	767	31.78	30.87	29.40
36	81,090	81,814	737	776	31.07	30.15	28.73
37	80,353	81,038	742	785	30.35	29.44	28.06
38	79,611	80,253	749	795	29.62	28.72	27.39
39	78,862	79.458	756	805	28.90	28.00	26.72
40	78,106	78 653	765	815	28.18	27.28	26.06
41	77.341	77,838	774	826	27.45	26.56	25.39
42	76,567	77,012	785	839	26.72	25 84	24.73
43	75,782	76,173	797	857	25.99	25.12	24.07
44	74,985	75,316	812	881	25.27	24.40	23.41
45	74.173	74.435	828	909	24.54	23.69	22.76
46	73,345	73,526	848	944	23.80	22.97	22.11
47	72.497	72,582	870	981	23.08	22.27	21.46
48	71,627	71,601	896	1,021	22.36	21.56	20.82
49	70,731	70,580	927	1,063	21.63	20 87	20.17
50	69,804	69.517	962	1,108	20.91	20.18	19.54
51	68,842	68,409	1,001	1,156	20.20	19.50	18.90
52	67,841	67,253	1,044	1,207	19.49	18.82	18.28
53	66,797	66,046	1,091	1,261	18.79	18.16	17.67
54	65.706	64,785	1,143	1,316	18 09	17.50	17.06
55	64,563	63 469	1,199	1,375	17.40	16.86	16.45
56	63,364	62,094	1,260	1,436	16.72	16.22	15.86
57	62,104	60,658	1,325	1,497	16.05	15.59	15.26
58	60,779	59,161	1,394	1,561	15.39	14.97	14.68
59	59.385	57,600	1,468	1,627	14.74	14.37	14.10
60	57.917	55.973	1,546	1,698	14.09	13.77	13.53
61	56,371	54,275	1,628	1,770	13.47	13.18	12.96
62	54,743	52,505	1,713	1,844	12.86	12.61	12.41
63	53,030	50,661	1,800	1,917	12.26	12.05	11.87
64	51,230	48,744	1,889	1,990	11.68	11.51	11.34

ENGLISH AND AMERICAN MORTALITY RATES.—*Continued.*

AGE.	American Table. Number Living.	Combined Experience. Number Living.	American Table. Number Dying.	Combined Experience. Number Dying.	American Table. Expectation of Life.	Combined Experience. Expectation of Life.	English Life Table No. 3 (Males). Expectation of Life.
65	49,341	46,754	1,980	2,061	11.10	10.97	10.82
66	47,361	44,693	2,070	2,128	10.54	10.46	10.32
67	45,291	42,565	2,158	2,191	10.00	9.96	9.83
68	43,133	40,374	2,243	2,246	9.48	9.47	9 36
69	40,890	38,128	2 321	2,291	8.98	9.00	8.90
70	38,569	35.837	2.391	2,327	8.48	8.54	8.45
71	36,178	33,510	2,448	2,351	8.00	8.10	8.03
72	33,730	31,159	2,487	2,362	7.54	7.67	7.62
73	31,243	28,797	2,505	2,358	7.10	7.26	7.22
74	28,738	26 439	2,501	2,339	6.68	6.86	6.85
75	26,237	24,100	2 476	2,303	6.28	6.48	6.49
76	23,761	21,797	2.431	2,249	5.88	6.11	6.15
77	21,330	19 548	2,369	2,179	5.48	5.76	5.82
78	18,961	17,369	2,291	2,092	5.10	5.42	5.51
79	16,670	15,277	2,196	1,987	4 74	5.09	5.21
80	14,474	13 290	2,091	1,866	4.38	4.78	4.93
81	12,383	11,424	1,964	1,730	4.04	4.48	4.66
82	10,419	9 694	1,816	1,582	3.71	4.18	4.41
83	8,603	8,112	1,648	1,427	3 39	3 90	4.17
84	6,955	6,685	1,470	1,268	3.08	3.6	3.95
85	5,485	5 417	1,292	1,111	2.77	3.36	3 73
86	4.193	4.306	1,114	958	2.47	3.10	3.53
87	3,079	3,348	933	811	2.19	2 84	3.34
88	2,146	2,537	744	673	1.93	2.59	3.16
89	1,402	1,864	555	545	1.69	2.35	3.00
90	847	1,319	385	427	1.42	2.11	2.84
91	462	892	246	322	1.19	1.89	2.69
92	216	570	137	231	.98	1.67	2 55
93	79	339	58	155	.80	1.47	2.41
94	21	184	18	95	.64	1.28	2.29
95	3	89	3	52	.50	1.12	2.17

RULES FOR THE CALCULATION OF LIFE EXPECTATION.

The following simple rules are taken from the "Agents Manual of Life Insurance." They are approximately correct.

RULES.

From 14 to 26, inclusive, deduct the age from 100; half the balance is the Expectation.
" 26 to 30, " " " 98; " " " "
" 31 to 40, " " " 96; " " " "
" 41 to 50, " " " 92; " " " "
" 51 to 60, " " " 90; " " " "

Or, deduct the age of the party, whatever it may be, from 80, and two-thirds of the difference is the average expectation; for example, if the age be 43; 80 — 43 = 37; ⅔ of 37 = 24⅔, the approximation average expectation, as given in the Carlisle Table.

IN INDIVIDUAL CASES, it must be remembered that a single expectation of life may be increased by the mere fact that the applicant, although in the line of hereditary taint, has passed the age when such tendency is likely to develop. The foregoing tables do not reveal this fact, which should be applied for the benefit of the insurable.

For example, where there is plainly an inherited tendency to phthisis —where parents, or brothers, or sisters have died of the disease before the age of twenty-five or thirty—and the party has lived and is now in good health at the age of forty, one-half of the danger may be said to have passed; at fifty, three-fourths; and at sixty, not over one-fifteenth of predisposition remains.

On the other hand, the tendency to gout, urinary diseases, insanity, apoplexy, paralysis, etc., increases with advancing years.

Thus, it is plain that an individual case may be an exception to the average expectation, either in favor of or against the acceptance of the candidate for insurance.

MALE OR FEMALE.

The annexed table shows the proportion of male deaths to one female death, in city and country, at different ages:

QUETELET'S TABLE.

AGE.	MALE DEATHS TO ONE FEMALE DEATH.		AGE.	MALE DEATHS TO ONE FEMALE DEATH.	
	Percentage. City.	Percentage. Country.		Percentage. City.	Percentage. Country.
Still born	1.33	1.70	18 to 21 years	.98	.92
0 to 1 month	1.33	1.37	21 to 26 "	1.24	1.11
1 to 2 months	1.37	1.20	26 to 30 "	1.00	.86
2 to 3 "	1.22	1.21	30 to 40 "	.88	.63
3 to 6 "	1.24	1.16	40 to 50 "	1.02	.83
6 to 12 "	1.06	1.03	50 to 60 "	1.07	1.18
1 to 2 years	1.06	.97	60 to 70 "	.96	1.05
2 to 5 "	1.00	.94	70 to 80 "	.77	1.00
5 to 14 "	.90	.93	80 to 100 "	.68	.92
14 to 18 "	.82	.75			

MARRIED OR SINGLE.

As a rule, it may be considered that married people are the most desirable risks, because not only are their habits of life apt to be more

regular, but the married relation in itself, if properly carried out, is considered more conducive to good health than the single state. The race of the applicant possesses a marked influence upon this rule, since in some races, notably that of the Hebrew, a large proportion of deaths among their married women occur from parturition and its attendant complications; and though it is usually considered that married women are better risks than single, yet, in the Hebrew race, the single are without doubt preferable. Among men, however, there is comparatively little difference as regards fatality between the married and single men, and it should therefore not be considered a matter of great importance. In regard to women, furthermore, the statistics of life insurance show that if a woman is married, the risk is proportionately greater until she reaches the menopause, so that many companies charge a higher rate for their insurance during this period.

Women who have borne at least one child without difficulty are better risks than primiparæ. The Examiner should be careful to elicit the answers to the following questions, which are to be proposed to the female applicant in addition to those contained in the regular form of application:

TO BE ANSWERED WHEN THE PERSON EXAMINED IS A WOMAN.—A. Has she any menstrual disorder, or history of uterine or ovarian disease, or has she suffered abortions or serious troubles in labor?.....B. Has she borne children; and if so, how many and how recently?..... C. Is she now pregnant?.....D. Has she had any disease or tumors of the breast?..... E. Has she passed the climacteric?.....

GENERAL APPEARANCE.

Examiners of considerable experience and observation place due confidence in the conclusions deduced from a close survey of the general aspect of the applicant—his presence, gait, manner, voice, etc. And many of them might be at a loss to give a reason for their belief, which would nevertheless be entitled to much respect. The knowledge of human nature is of great service in an examination.

THE NORMAL TEMPERAMENTS.

Temperament is a particular state of the constitution depending upon the relative proportion of the different masses of the human body, and the relative energy of its different functions. It has generally been observed from the standpoint of physiology and pathology, rather than from that of anatomy, and the classifications of temperament are founded on the distinct influences of the stomach, the lungs, the liver and the brain, either of which predominating gives its peculiar conformation and characteristics to the body. Under this arrangement we have

FOUR TEMPERAMENTS.—I. *The Lymphatic Temperament*, depending on the predominance of the stomach, being characterized by roundness of form, repletion of fat, softness of the flesh, a weak pulse and a languid

condition of the general system. The *complexion* is pale, the hair generally light, and the eyes light and dull. II. *The Sanguine Temperament*, depending upon the predominating influence of the arterial system, is indicated by a moderate plumpness of parts, tolerably firm muscles, light or chestnut hair, blue eyes, a strong, full pulse and an animated countenance. Persons with this temperament are ardent, lively and impressible, and possess more activity and energy than those possessing the lymphatic. III. *The Bilious Temperament*, having the liver for its basis, has for its external signs black hair, a dark yellowish skin, black eyes, firm muscles and angular forms. It indicates great activity, energy and power. IV. *The Nervous Temperament* is determined from the preponderance of the nervous system, and is marked by light, thin hair, slenderness of form, delicate health, general emaciation, rapidity of muscular action and vivacity in sensation. It imparts great sensibility and mental activity. This classification has a pathological signification—the lymphatic and nervous temperaments being really morbid and not healthy states of the constitution. We therefore prefer to base our arrangement upon an *anatomical and normal foundation* as follows: There are in the human body three grand classes of organs, each having its special function in the general economy; namely, *the motive or mechanical system; the vital or nutritive system, and the mental or nervous system.*

In accordance with this doctrine, there are *three temperaments*, determined by the predominance of the organs from which they take their name. The first is marked by a superior development of the osseous and muscular systems, forming the locomotive apparatus. In the second, the vital organs, the principal seat of which is in the trunk, give the tone to the organization. Over the third, the brain and nervous system exert the controlling power.

THE MOTIVE TEMPERAMENT.

In the motive temperament the bones are comparatively large and generally long, and the form manifests a tendency to angularity. The muscles are only moderately full, but dense, firm and possessing great strength. The figure is generally tall, the face long, cheek bones high, front teeth large, the neck long, shoulders broad, and chest moderately full. The complexion and eyes are generally dark, and the hair dark, strong and abundant. The features are strongly marked, the expression striking and sometimes harsh and strong. The whole system is characterized by strength and toughness, and is capable of great endurance. This temperament is generally prevalent and strongly marked among North American Indians, and is very common in Scotland, Ireland, Wales and France. In America, the States of Vermont, Maine, Kentucky, Tennessee, Missouri and Arkansas are noted for its development. It prevails in mountainous regions.

THE VITAL TEMPERAMENT.

This temperament, depending upon the predominance of the vital organs occupying the great cavities of the trunk, is necessarily expressed by breadth and thickness of body, rather than length. Its prevailing characteristic is rotundity. The chest is full; the abdomen well developed; the limbs plump and tapering, and the hands and feet relatively small. The neck is short and thick, the shoulders broad, and the head and face inclining to roundness. The complexion is generally florid, the eyes and hair light and the expression of the countenance pleasing. Persons of this temperament are both physicially and mentally active, love fresh air and exercise, but are not inclined to sedentary pursuits and hard work. Phrenologically, this temperament is noted for great animal propensities. An undue preponderance of the absorbent system, and a sluggish action of the circulatory organs, produce the lymphatic temperament which is denoted by bodily and mental languor, sloth and apathy.

The vital temperament is the prevailing one in Germany, Holland and England, and in low countries and valleys generally; also among negroes.

THE MENTAL TEMPERAMENT.

The mental temperament, depending upon the predominance of the brain and nervous system, is indicated by a frame relatively slight and a head proportionately large; an oval or pyriform face; a high, pale forehead, broadest at the top; delicately cut features; an expressive countenance; fine, soft hair; a delicate skin, and a high-keyed, flexible voice. The figure is often elegant and graceful, but seldom striking or commanding. It is the morbid development of this temperament, unfortunately very common in this age and country, which corresponds with the nervous temperament of the pathologists. It is characterized by emaciation of muscles, weakness of body, intensity of sensation and a morbid impressibility. The foundation for this perverted condition is laid in the premature and disproportionate development of the nervous tissues, and built up by sedentary habits, the immoderate use of tea, coffee, tobacco, stimulants and other hurtful indulgencies. It is the prevailing temperament among scholars everywhere, especially in Ireland, France and America.

BALANCE OF TEMPERAMENTS.

Where either of the temperaments exists in excess, the result is necessarily a departure from symmetry and harmony both of body and mind, the one always affecting the character and action of the other. *Perfection of constitution consists in a proper balance of temperaments*, and whatever tends to destroy this balance should be avoided. By observation, the important matter of temperament may be decided at a glance.

OTHER PHYSIOLOGICAL CONDITIONS.

QUALITY is the next physiological condition to be noted in the general appearance. Density gives weight and strength. Porous, spongy substances are light and weak. The lion is strong because his muscles, ligaments and bones are dense and tough. It is the same in man as in beasts, in brain as in muscle. Great vitality can exist only where a compact brain is combined with strong nerves and a dense, tough, firmly-knit body. High quality is essential to the highest order of power in mind or body.

HEALTH is the composite physiological condition always so prominent in the general appearance, when it exists. Its external manifestations are unmistakable.

RESPIRATION is one of the most important functions of the animal economy. Breath and life are one. The power of respiration depends on the relative size of the chest and health of the lungs, the state of the general health modifying it under all circumstances. The signs of good breathing power, in addition to a deep, broad chest, are considerable color in the face, warm extremities, elastic movements and general vigor. Where it is deficient, there is general pallor, with occasional flushing of the face, cold hands and feet, blue veins, and great liability to colds and coughs.

CIRCULATION is closely related to respiration, and the heart and lungs co-operate harmoniously in the work of manufacturing vitality. Between the heaving of the chest and the beating of the pulse, there is a definite rhythm both in strength and rapidity. The signs of a good circulation are a healthy color in the face and body, warm extremities and a slow, strong, steady pulse.

DIGESTION depends upon the condition of the digestive organs and the assistance of the circulation and respiration.

A good development of firm, solid flesh and a healthy color are signs of sound digestive organs. Emaciation, paleness, a sallow or pimpled skin, and a feverish and desponding state of mind, are indications of deranged digestion.

ACTIVITY is mainly a matter of temperament and is greatest where the motive and mental temperaments are both strongly developed. Its indications are length of body and limb, with very moderate fullness of muscle. The deer, the greyhound and the racehorse illustrate the fact that activity and ease of action are associated with length and slenderness of structure.

EXCITABILITY is another condition depending upon combination of temperaments and has its greatest normal manifestations in those possessing a full development of the vital and mental temperaments. It is morbidly active in persons whose nerves are disordered and whose systems are pervaded with the stimulation of liquor, tobacco, and strong tea and

coffee. In the lymphatic temperament, there is the opposite condition, a general coldness and apathy, which nothing seems to arouse.

BALANCE OF THESE PHYSIOLOGICAL CONDITIONS is essential to a healthy state of mind and body.

THE ABNORMAL TEMPERAMENTS.

As a general rule, each individual presents a combination of these temperaments, which must be determined by the judgment of the Examiner, in order to decide any particular proclivity to disease. In those races or families in which marriage with outsiders has been restricted, almost typical specimens of the normal temperaments are found. But in this country diverse nationality and parentage render it more and more difficult to establish these boundaries. According to age, the child approximates the sanguine or vital temperament; the mature adult, the bilious; while advancing age produces a tendency either to excess of the nervous or phlegmatic elements.

DISEASE TENDENCY.—Each temperament has a peculiar liability to certain forms of disease, more especially when any hereditary or acquired predisposition exists, or when the habits, occupation, residence, etc., of the applicant render him liable to the exciting causes of disease.

The Sanguine Temperament predisposes to miasmatic diseases, typhoid and remittent fevers, the exanthems, to acute rheumatism, organic and functional diseases of the heart and arteries, to hemorrhoids, and to tuberculosis, if nutrition is defective; in fact, to all acute inflammatory diseases.

The Phlegmatic Temperament, or the lymphatic, as some denominate it, predisposes to chronic inflammations, dropsies and fluxes of various sorts, especially from mucous membranes, influenza and scrofula. Dyspepsia is a common symptom. The power of assimilation is usually feeble, the skin pale and the blood-making capacity small. These defects tend to struma, consumption, heart and kidney affections.

The Bilious Temperament affords soil for endemic diseases, low fevers, derangements of the liver and stomach, dysentery, hemorrhoids, fistula. Heart complications occur with rheumatism.

The Nervous Temperament favors the occurrence of nervous diseases, insanity, epilepsy, paralysis, any of the neuroses, apoplexy, etc. Typhoid fever is apt to be fatal to this class.

THE COUNTENANCE.

From the aspect of the countenance, disease can often be diagnosed by the careful observer.

The Tuberculous Cachexia is associated with a delicate paleness and circumscribed flush of the face, thin features, long eye-lashes and pearly conjunctivæ.

The Cancerous Diathesis is denoted by a sallow, anæmic hue, marked with wrinkles of the face, indicative of physical pain.

Liver Diseases are apt to impart a yellow tinge to the complexion.

Kidney Affections are indicated by a sodden or waxy skin, puffy eyelids and a stolid countenance.

Heart Hypertrophy lends an unnatural fullness and congestion of the face, which is also occasioned by *habitual intemperance*, with the characteristic injection of the conjunctivæ.

Wasting Diseases, either local or general, give a wasted, painful aspect to the countenance.

Insanity is indicated by rapid change of expression, furtive glances of the eye, a staring, or unsteady look.

Paralysis is indicated by impaired motion, or by disordered movements.

Softening of the Brain renders the expression of the face dull, listless and vacant; the eyes languid and heavy.

COMPLEXION.

The hue of the complexion often draws attention to the presence of disease in distant organs. Persons living an out-of-door life are bronzed by exposure to the weather, but an unnatural color frequently results from disease. Residence in a malarial district superinduces a peculiar sallowness. Addison's disease of the supra-renal capsules is marked by a singular bronzed appearance. Intemperance and cardiac affections cause undue congestion of the skin, and there is often a livid complexion resulting from imperfect aeration of the blood. Incipient tuberculosis is characterized by lividity, with circumscribed evanescent flushes, while anæmia and albuminuria are characterized by a pallid and sodden appearance.

HAIR AND EYES.

This is of little significance except as a mark of identification, but still it is well for the Examiner to note the condition of the hair, whether it has fallen, or turned gray prematurely and without hereditary influence, as it may possibly lead to the supposition either of pre-existing syphilis or some cachexia due to a wasting disease. It is also well to remember that individuals having light, or sandy hair, are supposed to be more frequently affected with diabetes.

In regard to the eye, we have to note both the condition of the pupil and its expression. In regard to the former, whether it is dilated or contracted, or whether arcus senilis exists; whether there is projection, as found in disease of the heart; whether there is œdema of the lower lids, indicative of renal disease; whether the expression due to insanity is present,

or the peculiar pearly appearance of the conjunctivæ due to consumption or anæmia.

FIGURE.

The Examiner should note the physical proportions of the applicant; first, as to whether the applicant is compact or spare, thickset, corpulent or emaciated. Note whether the body is disproportionately long or short compared with the limbs. Usually a long trunk indicates endurance and strength. Emaciation should lead the Examiner to suspect phthisis or other wasting disease; and the size of the bones should be taken into consideration, as applicants having large bones and muscles are apt to be possessed of great endurance, and strong muscular structure and muscular development are always more desirable in a risk, owing to the fact that it is an index of assimilation and good health, and should rather predispose the Examiner in favor of the applicant.

RACE.

The Examiner should inquire of the applicant his nativity and the nativity of his parents.

The comparative mortality of different races is a topic of increasing interest. We append some facts from insurance reports.

Of the whole mortality, in over 5000 cases, those born in the United States give 75 per cent; Germany, 9½; Ireland, 4½; England, 4⅓; Scotland, 1¾ per cent. Total, United States, 75; Foreign born, 25 per cent. The fact of nativity seems to have very little influence on the cause of death, there being but slight variation from the 75 per cent for most of the diseases.

The following are exceptions. In typhoid and malarial fevers, diarrhœa, cholera and pneumonia, the percentage of the United States rises above 80; and in cancer, alcoholism, dropsy and peritonitis, it falls below 70 per cent.

Alcoholism. The deaths from this cause are chiefly among foreigners, in the following order: England, Ireland, Scotland and Germany.

Consumption varies considerably. It gives the largest proportional mortality among the natives of Ireland and the smallest among the English.

Apoplexy gives the largest percentage among the Scotch, and the smallest among the Irish; and the same ratio is true of nervous diseases generally.

Cancer. The foreign born give a much higher mortality from cancer than native Americans—35.17 per cent, instead of the usual average of 25. Among foreigners, the Germans give the highest proportion, and the Scotch the lowest.

Heart disease prevails uniformly among different nationalities.

Digestive diseases. Ireland gives the largest percentage for diseases of the stomach, and the smallest for diseases of the bowels.

Kidney diseases are more fatal among the Scotch.

Accidental deaths occur equally among all races.

Suicides are equally frequent among the native born, the Germans and the English. The Irish and Scotch afford very few instances.

The tables relating to deaths among persons of other nationalities are too few to form a basis for calculation.

The comparative mortality of the white and colored races is given in the following tables, compiled from the Census Report, and the two last on the authority of Dr. W. A. Hammond :

SHOWING THE COMPARATIVE MORTALITY OF WHITES AND BLACKS IN THE UNITED STATES, FROM DISEASES MENTIONED IN THE LIFE INSURANCE APPLICATIONS, FOR THE YEAR 1850.

CAUSES OF DEATH.	NUMBER OF DEATHS.		RATIO IN 100,000 DEATHS.	
	White.	Colored.	White.	Colored.
Apoplexy	10,184	944	18,691	10,107
Asthma	926	258	1,699	2,762
Bronchitis	6,722	2,094	12,337	22,420
Cancer	3,179	346	3,834	3,704
Consumption	70,893	7,771	130,117	83,203
Colic	.....	.....	.....	.....
Diphtheria	1,529	9	2,806	96
Diseases of the heart	7,662	849	14,062	9,000
Dropsy	13,891	4,766	25,495	51,029
Fits (epileptic)	1,074	202	1,971	2,162
Fistula	26	7	47	74
Gout	79	5	144	53
Intemperance	1,792	177	3,289	1,895
Insanity	574	91	1,053	974
Influenza	341	144	625	1,541
Liver complaint	3,211	294	5,893	3,147
Paralysis	.....	.....	.....	.....
Palpitation	.....	.....	.....	.....
Quinsy	1,284	313	2,356	3,351
Rheumatism	1,500	363	2,753	3,886
Rupture	367	149	673	1 695
Scarlet fever	23 721	1,681	43,537	17,998
Spitting of blood	.....	.....	.....	.....
Diseases of urinary organs	3,308	276	6,068	2,972
Syphilis	657	149	1,207	1,595

NOTE.—The blank spaces indicate that the diseases opposite them are regarded as symptoms merely.

In the following table is given the total death rate per 1000, and also the death rate under five years of age, in Charleston, S. C.; Savannah, Ga.; Nashville and Mempis, Tenn., for the years 1883–85:

	Charleston.	Memphis.	Nashville.	Savannah.
	1883.	**1883.**	**1883.**	**1883.**
White	21.60	15 19	18.68	20.47
Colored	47.13	35.83	31.29	39.57
Aggregate	34.92	22.50	23.50	30.02
	1884.	**1884.**	**1884.**	**1884.**
White	23.68	18.80	16.77	19.54
Colored	44.63	41.66	26.94	42.21
Aggregate	34.55	26.90	21.94	30.82
	1885.	**1885.**	**1885.**	**1885.**
White	17.64	16.56	14.69	12.09
Colored	38.49	36 96	27.07	34.04
Aggregate	28.88	23.80	19.10	23.65

RATE OF DEATHS UNDER FIVE YEARS.

	Charleston.	Memphis.	Nashville.	Savannah.
	1883.	**1883.**	**1883.**	**1883.**
White	5.88	3.75	5.65	7.59
Colored	21.03	13.91	12.44	18.01
Aggregate	13.45	8.83	9.04	12.80
	1884.	**1884.**	**1884.**	**1884.**
White	6.48	4.47	5.46	6.54
Colored	16,52	15.63	11.55	16.68
Aggregate	11.50	10.05	8.50	11.61
	1885.	**1885.**	**1885.**	**1885.**
White	4.45	4.67	4.37	4.23
Colored	14.38	13.46	10.78	13.70
Aggregate	9.41	9.06	7.57	8.96

TABLE SHOWING THE COMPARATIVE MORTALITY OF WHITE AND BLACK TROOPS FROM CONSUMPTION AT SEVERAL OF THE BRITISH MILITARY STATIONS, AS IT OCCURS FROM YEAR TO YEAR (HAMMOND).

STATION.	RATIO OF DEATHS IN 1000.	
	White Troops.	Colored Troops.
Jamaica	7.5	10.3
Bahama Islands	6.0	9.7
Honduras	3.0	8.1
Sierra Leone	6.0	6.3
Mauritius	4.0	12.9
Ceylon	4.9	10.5
Gibraltar	5.3	4.3

TABLE SHOWING THE COMPARATIVE MORTALITY FROM MALARIAL DISEASES OF WHITE AND BLACK TROOPS, FROM 1818 TO 1836 (HAMMOND).

STATION.	RATIO OF DEATHS IN 1000.	
	White Troops.	Colored Troops.
Jamaica	101.9	8 2
Bahama Islands	15.9	5.6
Honduras	81.0	4 4
Sierra Leone	410 0	2.4
Mauritius	1.7	0.0
Ceylon	24.6	1.1

DEVELOPMENT.

The Examiner should scrutinize the whole body for external defects to govern him in his final judgment of the risk. He should note the formation of the head and face for indications to determine the physical stamina of the applicant. An examination of the trunk will show whether or not the curves of the spine are normal and if there is any deformity. He should observe the relative development of thorax, abdomen and lower extremities; the texture of the skin; the presence of scars or marks of previous disease, which, existing on the neck, point to scrofulous taint; on the groin, to syphilis; the condition of the surface veins; the existence of local par-

alysis, resulting from lead poisoning or affections of the nervous system, of spasms and tumors; the appearance of the hands and nails.

THE SIZE OF THE BONES AND CONTOUR OF THE MUSCLES.—Strong bones and muscles indicate vitality and endurance.

THE DIATHESIS.

Diathesis is a morbid condition, predisposing to the development of a particular disease, and relates to disease as temperament does to health. Such unsoundness of constitution may be due to deficient vitality, transmitted from parents who were too far advanced in life to produce robust issue, or whose vigor had been sapped by dissipations or constitutional diseases. It is of the nature of premature senility. In some the diathesis is inherited. Congenital syphilis, gout, scrofula, tuberculosis, cancer, asthma and many neuroses are apt to appear in the offspring at a certain age, in consequence of some inherited tendency in the blood and tissues.

In others the diathesis is acquired, either from unwholesome surroundings or the infection by some specific poisons, such as any of the zymotic diseases.

The strumous diathesis is a common one, and arises from deficient and defective nutrition, ending usually in scrofulosis or tuberculosis. Impairment of assimilation and function characterizes this diathesis.

The gouty, or rheumatic diathesis, is becoming very frequent in this age of high living and habits. In it there is a predisposition to the undue formation of uric acid, to congestions, irritation or inflammation of the muscular and sero-fibrous tissues of the vascular systems, serous membranes and the peritoneum, which develop speedily into gout and rheumatism without proper treatment.

The adipose diathesis is self-evident, and there are many others premonitory of well-known diseases.

THE CACHEXIA.

The cachexia is a chronic state of ill health, which may not be due to disease of any organ, but dependent upon a depraved state of the blood. It rather signifies the morbid constitution, which is the disease, and it may precede any local manifestation of the latter. Thus we may have the cancerous cachexia, culminating in malignant disease of any organ; the tuberculous, ending in pulmonary tuberculosis, etc. When the cachexia supervenes upon the diathesis, the prognosis becomes grave, but this is not always the case. Other cachexias are the syphilitic, erysipelatous, anæmic, chlorotic, rachitic, etc.

BLINDNESS.

Either partial or complete blindness, involving as it does the constant risk of accident, should debar from life insurance. The extent of the

impairment of sight, and the causes which led thereto, should be stated by the Examiner.

DEAFNESS.

The extent and causes of deafness, if it exists, should be plainly stated by the Examiner. If complete, the applicant should be rejected. If partial, it must be left to the decision of the executive, therefore all facts bearing upon the case should be elicited by the Examiner and carefully recorded.

VACCINATION.

The scar of a recent vaccination should be searched for and the date of it determined, as its effects are supposed to become inoperative after the lapse of a certain time, supposed to be from five to seven years. Revaccination in the required number of cases should be insisted upon, and when the applicant has never been vaccinated, his application should be refused until he has complied with this necessary procedure.

DEFORMITIES.

Loss of the lesser limbs or deformity from a mechanical injury, need not disqualify, unless locomotion be impeded thereby or is sufficient to cause bodily insecurity. But when the loss is due to malignant disease, caries, necrosis, joint disease, carcinoma, morbid growth or cachectic deposits, or from capital operations, depriving the subject of a great amount of tissue, tending thereby to impair the constitution, the applicant should be declined.

HERNIA.

Hernia is one of the most prevalent disorders to which the human race is subject.

Frequency.—One in every fifteen of the adult population is ruptured. The ratio between females and males is one to fourteen, though among the former it is more apt to be fatal, from the fact that they are subject to a more dangerous form, the femoral or crural, which more frequently becomes strangulated; and also, because they generally defer treatment until the eleventh hour from false motives of delicacy. Among women it occurs oftener during the child-bearing years.

Ages.—The following table shows its frequency according to age:

YEAR.	Percentage.	YEAR.	Percentage.
First year	1 in 21	Thirty-fifth year	1 in 17
Second year	1 in 29	Fortieth year	1 in 9
Third year	1 in 37	Fiftieth year	1 in 6
Thirteenth year	1 in 77	From sixty to seventy	1 in 4
Twenty-first year	1 in 32	From seventy to seventy-five	1 in 3
Twenty-eighth year	1 in 21		

Varieties.—The oblique inguinal and femoral varieties are more dangerous than the umbilical and direct; the irreducible than the reducible. In order to obtain insurance, a suitable truss must be worn to prevent the descent of the intestine. Cases of double hernia are still more hazardous, and some authorities advise rejection in every instance. A hernia that has been cured by operation is very liable to recur.

Diagnosis.—Enlarged glands and tumors, retained testicle or hydrocele are frequently mistaken for hernia, and *vice versa.* Great care is therefore requisite in settling the question of diagnosis. One of the most reliable signs of hernia is the direct impulse, felt by the finger of the surgeon, when the applicant coughs; and in the majority of cases, proper posing of the patient, combined with taxis, will succeed in reducing the hernia.

Statistics.—From the Medical Directors' Report of the Mutual Life Insurance Company of New York, covering the first thirty years of that company's experience, we state the following conclusions: "The total deaths from hernia were only five. In none of these cases had an operation been performed; in only two did the hernia exist at the time of insurance." From that record the conclusion was reached that the presence of a hernia adds little to the risk of death, provided a proper truss is worn. That company has insured large numbers of ruptured persons, and yet in a period of thirty years only two have died from that cause.

FISTULA IN ANO.

Fistula is generally a local disease and amenable to proper surgical treatment. The anus should be examined for this condition, and its cause ascertained, if it exists. Unhealed it is a source of exhaustion.

Causes.—Fistula is usually caused by local ulceration of the parts from hemorrhoids, dysentery or mechanical injury, but it is not infrequently a local expression of the tuberculous taint.

Disqualification.—It should disqualify—(1.) When it is one of the symptoms of tuberculosis. (2.) When it does not yield to correct treatment, and becomes a constant source of exhaustion.

Mortality.—Among over 5000 deaths in the Mutual Life Insurance Company, covering the first thirty years of its experience, only two died from fistula in ano.

An applicant possessing fistula should be postponed until a surgeon's certificate is received, stating that the condition is cured.

WEIGHT AND HEIGHT.

Although a large proportion of applicants may be able to give their weight within a few pounds, the Examiner should make it a rule to weigh

the persons, and subscribe of his own knowledge to this important factor. And the same precaution applies to height.

HEIGHT.—The maximum of height is usually attained at the age of twenty-five, the rate of increase being ten inches between the ages of eleven and eighteen, and but two inches from that age to maturity. When the increment of the latter epoch exceeds two inches, it is indicative of a corresponding exhaustion of the nutritive powers and militates against the chances of long life, as a general rule.

Average height of adult males in America is five feet eight inches; of adult females, about five feet two inches. Emigrants from Europe average under five feet six inches, with the exception of Sclavs, Poles and Hungarians, who equal the American standard of height. Five feet seven inches is the mean for emigrants from the British Islands. In the United States, the height of the country people is said to be above that of the city bred, while in Europe the reverse is true; which shows that the favoring influences of hygienic surroundings are variable in different people and places.

EXTREMES OF HEIGHT.—*Very tall men* are commonly deficient in muscular and respiratory power, and suffer a tendency to diseases of the heart and lungs. They are more subject to rupture, varicose veins and chronic ulcers of the lower extremities. When suffering from acute affections, a chronic form of the same disease is likely to supervene and break down the constitution.

Very short men are apt to suffer from lack of development and vitality, and fall easier victims to acute and epidemic diseases. The downward range from the average height is safer than the upward, provided the organs of respiration, circulation and innervation are in a normal condition, because the small person is more easily nourished and is not as apt to overtax his strength.

In persons exceeding the average stature, one often finds a development of bone and muscle at the expense of the vital internal organs, with the consequent deterioration of life expectation.

WEIGHT.—The average weight among males varies, according to age, from 145 to 160 pounds. Excessive obesity at any age vitiates the risk, especially if it has appeared with comparative suddenness, and cannot be recognized as an inherited tendency in an otherwise healthy family. At the same time, it must be remembered that the human race is prone to corpulency after maturity, so that it may be safe to allow a discrepancy of fifteen or twenty pounds in either direction, from the published tables, when the family and personal histories are good.

Comparative Weight of the Sexes.—At the age of twelve years the weight of males and females is equal, but both before and after that period the male exceeds the female both in size and weight. Quetelet asserts that the female reaches her maximum weight later in life than the male. Progressive increase of weight from birth to the decline of life is normal and independent of the maturity of growth, which occurs at the age of twenty-five years. The later increase of weight is due to the deposit of adipose tissue under

the skin and within the cavities of the body. The tendencies to fatty degenerations and apoplexy must not be overlooked. Sedentary occupations, with an ample food supply, cause increase of weight.

Diminution of weight ensues from active muscular exercise in the open air, accompanied by a restricted diet. Local emaciation points to incipient phthisis, and is denoted by wasting of the thorax and bones, before it is noticeable elsewhere.

Sudden changes of weight demand careful consideration, and are more untoward than habitual departures from the normal standard. The rapid occurrence of corpulence suggests an abnormal state of nutrition, as would result from sedentary habits, intemperance and internal organic diseases. Rapid emaciation denotes the approach of some form of wasting constitutional disease.

RELATIVE HEIGHT AND WEIGHT.—A normal variation of twenty per cent is allowable under favorable conditions. Dr. Brinton says: "An adult male in good health, five feet six inches high, ought to weigh rather more than 140 pounds, and for every inch above or below this height we may add or subtract five pounds."

Relative Chest Measurement.—This indicates the proportions of height to weight. Brent's rule, measurements to be made over the nipples, is the standard.

Irrespective of height, the circumference of the chest increases one inch for every ten pounds increase of weight.

Maximum Chest.—Two-thirds of the stature equals the circumference of the chest.

Medium Chest.—Half of the stature plus one-fifteenth of the stature, equals the circumference of the chest.

Minimum Chest.—Half of the stature minus one sixty-first of the stature, equals the circumference of the chest.

TABLES OF PROPORTIONS.

HEIGHT.	Weight.	Medium Chest.
	Pounds.	*Inches.*
5 feet 1 inch should weigh.....	120	34 06
5 " 2 inches " "	125	35.13
5 " 3 " " "	130	35.70
5 " 4 " " "	135	36.26
5 " 5 " " "	140	36.83
5 " 6 " " "	143	37.50
5 " 7 " " "	145	38.16
5 " 8 " " "	148	38.53
5 " 9 " " "	155	39.10
5 " 10 " " "	160	39.66
5 " 11 " " "	165	40.23
6 " .. " " "	170	40.80

Persons over forty years old may be allowed an increase of about two pounds for every inch above five feet, as follows:

HEIGHT.	Pounds.	HEIGHT.	Pounds.
5 feet 1 inch	127	5 feet 7 inches	169
5 " 2 inches	134	5 " 8 "	176
5 " 3 "	141	5 " 9 "	183
5 " 4 "	148	5 " 10 "	190
5 " 5 "	155	5 " 11 "	197
5 " 6 "	162	6 " "	204

The following table gives the over and under-weight limits; and if the applicant is either above or below the figures here stated, he should be rejected by the Examiner, unless his physique be unusually excellent, or it be an hereditary trait. In either case the Examiner should state the reasons for his acceptance very fully. If the condition be temporary, the applicant should be postponed.

HEIGHT.	Chest.	Standard Weight.	Twenty Per Cent Under Weight.	Forty-five Per Cent Over Weight.
	Inches.	*Pounds.*	*Pounds.*	*Pounds.*
5 feet	33½	115	92	167
5 " 1 inch	34	120	96	174
5 " 2 inches	35	125	100	181½
5 " 3 "	36	130	104	188½
5 " 4 "	36½	135	108	195
5 " 5 "	37	140	112	203
5 " 6 "	37½	143	114	207
5 " 7 "	38	145	116	210
5 " 8 "	38½	148	119⅓	215
5 " 9 "	39	155	124	224⅓
5 " 10 "	39½	160	128	232
5 " 11 "	40½	165	132	239
6 " 0 "	41	170	136	246
6 " 1	41½	175	140	254

EXAMINATION OF THE CHEST.

SINCE so large a proportion of the deaths in adult life occur from pulmonary and cardiac diseases, it is especially important that the Examiner should exercise great care in the physical exploration of this region of the body.

It is not always that an applicant can be examined in a physician's office, or in the office of the company. Very frequently the exigencies of business require the examination to be conducted in his own place of business, where it is simply impossible to have his clothing removed, so that the Examiner is often called upon to make a thorough examination without having an applicant entirely stripped, and the author would suggest the plan shown in the accompanying engraving as being available at all times and in all places, and as one also to which the applicant is not liable to object. Direct the applicant to remove the coat and vest, and then drop the suspenders. He is then to release his shirt, which is to be rolled up as far as possible, and held directly under the chin by the hands of the applicant himself. This method is expeditious and satisfactory to the applicant, who usually objects to undergoing the discomfort of removing all his clothing above the waist.

EXAMINATION OF THE LUNGS.

A well-developed thorax is usually considered an indication of vital capacity and endurance. *Respiration* may be defined as a mechanical, involuntary process, consisting of inspiration and expiration.

Residual air is the term applied to that portion which cannot be expelled from the lungs by the most forcible expiration.

Supplementary, or reserve air, can be expelled by forcible expiration.

The breathing, or tidal air, is the portion used in ordinary respiration.

The complementary air is that portion which can be inhaled by means of the greatest inspiration.

The number of respirations per minute in a normal adult at rest is from fifteen to twenty. They exceed this number in childhood, in high altitudes, and during exercise; they are diminished in old age and by the action of certain medicines and diseases.

There is a constant ratio between the rate of respiration and the pulse; in health it is as one to four and one-half. Any marked deviation from this

proportion should excite suspicion of some latent cause. Among females, youths and people of a nervous temperament, the rate of respiration is easily increased by any temporary excitement. The fifth expiration has been observed to be a little deeper than the average. The ratio of inspiration, expiration and quiescence is about as five, four and one, respectively.

Irregularities of respiration demand careful scrutiny. Prolonged expiration is usually a symptom of local lung lesion. Irregular, intermittent or jerking respiration indicates nervous derangement.

The type of respiration should be abdominal in the infant, diaphragmatic and inferior costal in the adult male, and superior costal in the adult female. Note carefully any change of type. Pectoral breathing, especially in the male, with rising of the shoulders, denotes pulmonary disorder.

RESPIRATORY POWER AND VITAL CAPACITY.—These are synonymous terms. Dr. Hutchinson has compiled the following table showing the various degrees of respiratory power:

TABLE OF RESPIRATORY POWER.

Inspiratory Power.			Expiratory Power.	
1½	inches	is weak	2	inches.
2	"	" ordinary	2½	"
2½	"	" strong	3½	"
3¼	"	" very strong	4½	"
4½	"	" remarkable	5⅘	"

RESPIRATORY POWER, HEIGHT AND WEIGHT.

HEIGHT.	Respiratory Power—Cubic Inches.	Weight—Pounds.
Under 5 feet	135	92.26
5 feet 0 inch to 5 feet 1 inch	175	115.52
5 " 1 " " 5 " 2 "	177	124.33
5 " 2 " " 5 " 3 "	189	127.86
5 " 3 " " 5 " 4 "	193	138.01
5 " 4 " " 5 " 5 "	201	139.17
5 " 5 " " 5 " 6 "	214	144.93
5 " 6 " " 5 " 7 "	229	144.29
5 " 7 " " 5 " 8 "	228	152.59
5 " 8 " " 5 " 9 "	237	157.76
5 " 9 " " 5 " 10 "	246	166.40
5 " 10 " " 5 " 11 "	247	170.86
5 " 11 " " 6 " .. "	259	117.45
Over 6 feet	276	218.66

The mean for all heights being 217 cubic inches.

The second table, which was also compiled by Dr. Hutchinson, shows the mean vital capacity of 1923 men.

A man five feet eight inches high should have a breathing capacity of about 230 cubic inches of air, although during tranquil respiration the

tidal air does not amount to more than thirty cubic inches. For every inch of stature between five and six feet, eight additional cubic inches of air are given out by a forced expiration. This proportion should be maintained.

The spirometer is used to verify these tests, and it would be a useful piece of furniture in the examining room.

The extreme breathing capacity is less in women than in men, and less in childhood than in adult life. It is diminished by obesity. Its volume increases with age to the thirtieth year, and gradually decreases to the decline of life. At the age of sixty-six years, it is computed that there is a diminution of four-fifths from the maximum rate.

In some cases there is diminished vital capacity, combined with unmistakable muscular strength; and again others show extraordinary breathing capacity. The discrepancy is due to lack of exercise and practice.

MENSURATION OF THE CHEST.

In mensuration, an ordinary tape line is sufficient for the purpose of life insurance examinations. To measure the circumference of the chest, a spinous process of one of the vertebræ is chosen as a fixed point, and the tape is then passed around the body to the same point, a line just above the nipple being the best for this purpose. It should be noted whether the distance from the spinous process to the median line anteriorly is the same on both sides; and the measurements of the chest during full inspiration and expiration, as also the average measurement, should be taken.

It must be borne in mind that, even in health, the measurement of the two sides is apt to vary, right-handed persons being on an average half an inch larger on the right side. In taking the chest measurement, the Examiner should be careful to measure next the skin, and should take the greatest, medium, and least expansion. The difference between the greatest and least expansion is usually considered to indicate the degree of vitality.

Consumptives, by the records of the Mutual Life, have an average measurement of one and one-half inches less than non-consumptives, and a disproportionately small chest measurement should be considered suspicious.

The measurements should be taken at a little above the navel in males, and a little above the mammæ in females. The extreme between inspiration and expiration, however, can be greatly increased by systematic exercise, it being possible for a man of comparatively slight physique to so habituate himself by constant practice to expansion of the chest, that the difference between the expiration and inspiration will be markedly beyond the average, while, on the other hand, it is often seen that persons of powerful physique and strong constitutions have comparatively little difference in the measurements of inspiration and expiration, owing to entire lack

of practice; so that great expansion cannot be accepted in all cases as being indicative of vital capacity, although in ordinary cases it is not without its value.

Allen states that "it is well to bear in mind that due proportion requires that the circumference should equal twice the distance between the angles of the shoulders, that it should be four times the antero-posterior diameter at the lower portion of the sternum, and that this latter diameter should equal the distance between the nipples."

The expansion and capacity of the chest are diminished in obese individuals. They are also less in females and in children than in adult males, and increase with age to the thirtieth year, gradually decreasing from this to the decline of life.

The average expansion is a little over three inches when the inspiration is a forced one, but in ordinary breathing it is scarcely more than an inch, the right side expanding a little more than the left.

REGIONS OF THE CHEST.

The surface of the chest is divided, for convenience sake, into the anterior, posterior and lateral surfaces.

The anterior surface is subdivided into the upper region, extending from the fourth rib to just above the clavicle, and the lower region, extending from the fourth rib downward.

The posterior divisions are the same.

For convenience, also, we designate the space between the two scapulæ as the inter-scapular space, and the spaces just above and below the clavicle as supra and infra-clavicular spaces.

METHODS OF EXAMINATION.

The examination of the chest is conducted by means of, first, inspection; second, palpation; third, percussion; fourth, auscultation; fifth, mensuration.

INSPECTION.

Note the size, form and movements. The size of the chest can only be judged accurately by mensuration, but it can be approximately divined by the eye.

MOVEMENTS.—It should be noticed that the two sides of the chest are to a great extent symmetrical in movement, both sides rising equally during inspiration and sinking during expiration, the motion of inspiration being longer than that of expiration, and the interval between them extremely slight. This movement is called the respiratory movement and is visible over the whole thorax; in males, more distinct at the lower portion of the chest, and in females, at the upper. The number of respirations in health varies from sixteen to twenty to the minute; but, in certain pulmonary affections, these numbers are greatly exceeded, although increased fre-

quency of breathing can occur independently of disease of the lung, as when the diaphragm does not descend; and when this is found to be the case, it should lead to an examination for abdominal tumors, or dropsy, or adhesions caused by peritonitis. If the motions of the chest be very slow, cerebral disease should be suspected; in such cases the breathing tends to be altogether abdominal.

If the movements of the chest are plainly visible from one side and the reverse on the other, the Examiner should suspect the existence of pleurisy, of pneumo-thorax, or hemiplegia.

THE FORM OF THE CHEST.

Contraction may denote a lung of diminished size, due to chronic change in its tissues, or to tubercle or adhesions.

Expansion should lead the Examiner to suspect emphysema, pleuritic effusion, thoracic tumors, or hypertrophy of the heart.

The form of the chest is also altered by curvatures of the spine or congenital malformations, the existence of which, or a varicose condition of the veins on the surface of the chest, should lead the Examiner to suspect emphysema or tumor, or some intra-thoracic affection causing a disturbance of the circulation.

PALPATION.

Palpation is to be practiced by applying the palmar surface of one or several fingers evenly, without too much pressure on the part of the Examiner.

Palpation, or the application of the hand, is also an aid in determining the size, movements and form of the chest; but, in addition, it is used as a means of diagnosis in determining the density and condition of tumors, the frequency of the breathing, the action of the heart, the state of the thoracic walls, and to locate tender spots. Ronchial or sonorous fremitus, which is the term given to vibrations produced by ronchi, may also be distinguished by palpation, as may also vocal fremitus.

Palpation is also of use in detecting fluid by means of fluctuation, and a roughened serous membrane may be diagnosed by means of friction fremitus. When both fluid and air are present and the applicant is shaken, a distinct vibration is felt, accompanied by a splashing sound. This is known as succussion.

PERCUSSION.

In practicing percussion, the Examiner may simply use the fingers or employ the hand. If the fingers are used, the palmar surface of the left index or middle finger should be applied to the applicant's chest, and struck with the tips of the fingers of the other hand. Sounds are made more distinct by placing the applicant with his back against a door. The whole

movement should proceed only from the wrist, and ought to be quick and not too forcible.

SOUNDS PRODUCED BY PERCUSSION.

The character of the sounds should be noted with reference to the quality, intensity, pitch and duration.

The varieties of percussion sound are pulmonary resonance, dullness, flatness, tympanitic resonance, amphoric resonance and cracked-pot resonance.

1. PULMONARY RESONANCE.—This is a clear sound, obtained by striking over normal pulmonary tissue. In health, its quality is pulmonary, its duration is marked, its pitch is low, and its intensity varies in different subjects. In disease, it may be changed; if one lung does not respire, the pitch is higher and the intensity greater over the other. This is also the case in emphysema of both lungs, and also over the lung tissue, when the lower portion of the thoracic cavity is filled with effusion.

2. DULLNESS.—A dull sound denotes absence of air. In health it is present where the chest wall is thickened, and where the liver and heart are in contact with the lung, and over the heart itself. In disease it may be caused by pleuritic adhesions, tumors, accumulations of fluid in the pleural cavities, by œdema, pneumonia, hemorrhages, phthisis, by emphysema, or by hypertrophy of the heart, liver and spleen, or by aneurisms or abscesses.

There are many different degrees of dullness, and it is always associated with an increased sense of resistance to the percussing finger.

3. FLATNESS.—Flatness is heard over solid viscera and over the thick muscles of the back; its quality is flat, its pitch is high, its duration is short, its intensity is not great. In diseases, if found over the lungs, it may be produced by very thick pleuritic adhesions, by complete consolidation of the lung, especially over adhesions, by large accumulations of fluid in the pleural cavities, by hypertrophy of the solid viscera, and by tumors and abscesses.

4. TYMPANITIC RESONANCE is a non-vesicular sound, having the character of that obtained by percussing the intestine, and is not heard in the normal chest except occasionally, when it is the transmitted sound of a distended stomach or intestine; but in disease it is heard over the air in the pleural cavities, over large cavities in solidified lung, over lung compressed by fluid, and in some cases of emphysema.

5. AMPHORIC RESONANCE is a variety or modification of the tympanitic resonance. It has a sound of raised pitch, with a peculiar metallic quality, and is heard over large cavities in solidified lung, and over air in the pleural cavities.

6. THE CRACKED-POT SOUND is also a variety of tympanitic resonance, In order to obtain it the applicant should be made to keep his mouth open

when percussion is made. The condition usually producing the sound is a cavity communicating with the bronchial tube, and it is heard over cavities in solidified lung and over lung compresssed by fluid.

PERCUSSION OF THE NORMAL CHEST.

The anterior portion of the chest affords a clearer sound than the posterior on account of the difference in the thickness of the thoracic walls.

In the supra-clavicular regions, dullness is met with over the apices of the lungs. In the infra-clavicular regions, on the left side and in front, from the upper edge of the third rib to the lower edge of the clavicle, there is pulmonary resonance; on the right side, from the top of the fourth or fifth rib to the lower edge of the clavicle, there is pulmonary resonance, but this is of a lower pitch than that of the left side.

In the præcordial region, over an area corresponding to the size of the heart, there is dullness, which is more marked where the heart is uncovered by the lung. Where the sternum covers the heart, the sound is still further modified by the presence of the bone.

From the fourth rib downward, on the right side, the resonance of the lung, on strong percussion, becomes slightly deadened, and near the sixth rib, the upper edge of the liver should be indicated by the presence of a perfectly dull sound. During full inspiration, the dull sound begins an inch or so below this, owing to the liver being pushed downward by the respiratory effort.

In the posterior portion of the chest, in the supra scapular regions, there is dullness on percussion, increasing in proportion to the amount of muscle or fat possessed by the applicant. In the scapular regions the percussion sound is also dull; and in the infra-scapular regions, from the angles of the scapula downward on both sides for a distance of about five inches, there is pulmonary resonance. Below this, the percussion line is flat, the line of flatness being usually about an inch higher on the right than on the left side.

In the inter-scapular regions, there is pulmonary resonance on percussion; and in the axillary, on the left side, dullness begins at the level of the sixth rib; and at the level of the seventh and below, there may be either dullness, flatness or tympanitic resonance, but on the right side there is pulmonary resonance from the axilla down to the fifth rib, from which region there is dullness extending down to the sixth rib, where flatness is elicited, continuing down to the free border of the ribs.

AUSCULTATION OF THE LUNGS.

In practicing auscultation, the Examiner may use the method known as the immediate, by direct application of the ear to the chest, or the mediate,

by means of the stethoscope; and while auscultating, he should avoid stooping or having the head too low.

Over the healthy chest we hear three kinds of breathing, pulmonary, bronchial and bronchial-vesicular. In each of these, the inspiration and expiration should be noted in respect to the quality, the pitch, the intensity and the duration.

1. PULMONARY BREATHING.—The inspiration is of pulmonary quality, considerable duration, low pitch and variable intensity. The expiration is the same, except that it is of shorter duration; in many healthy chests it is entirely absent. In the right infra-clavicular region, both inspiration and expiration are often of higher pitch, and the expiration is longer than over the rest of the chest. It should be borne in mind that there is much difference in the intensity of the breathing in the chests of different healthy adults

2. BRONCHIAL-BREATHING.—This is heard over the larynx, the trachea and the upper part of the sternum. The inspiration is of tubular quality, of higher pitch, of marked intensity, and of considerable duration. The expiration is the same, except that it is of greater intensity and of longer duration than inspiration.

3. BRONCHIAL-VESICULAR BREATHING can often be heard in the inter-scapular region; it is intermediate in character between pulmonary and bronchial, while it may partake of the character of each; in quality, it approaches that of bronchial or pulmonary breathing; its pitch is higher than that of pulmonary, while not as high as that of bronchial beathing, while the expiration is longer and of higher pitch than in pulmonary breathing.

VARIETIES OF RESPIRATION IN DISEASE.

1. *Exaggerated, or puerile breathing*, is heard over the lungs in some cases of vesicular emphysema.

2. *Diminished breathing* is frequent in phthisis and in emphysema, and is heard over lungs into which less air than usual is inspired.

3. *Suppressed breathing* is observed in pleurisy with effusion, intra-thoracic tumors, obstructed bronchi, pneumonia and phthisis, and in all cases where little or no air enters the lungs.

4. *Bronchial breathing* is heard over consolidated and compressed lungs, and over cavities. In quality it is tubular or bronchial; its pitch is high, and its expiration longer and of higher pitch than inspiration.

5. *Broncho-vesicular breathing* is heard over lesser degrees of consolidation and compression of the lung, and is intermediate in its character between bronchial and pulmonary breathing.

6. *Cavernous breathing* is heard over cavities, consolidated lung, and over compressed lung. In quality it is cavernous, in pitch low, and its expiration is longer and of lower pitch than inspiration.

7. *Amphoric breathing* is heard over large cavities, and over the chest

in pneumo-thorax, and resembles the cavernous except in its quality, which is of a peculiar musical character.

8. *Sibilant* and *sonorous breathings* are heard in acute and chronic bronchitis, emphysema and asthma, and are supposed to be caused by irregular contractions in the walls of the bronchi.

Sibilant Breathing is whistling in quality, high in pitch, and the expiration is prolonged.

Sonorous breathing is sonorous in quality, low in pitch, and in it expiration is also prolonged.

RÂLES.

The word râle is used to designate certain sounds which do not exist in the healthy state, and which cannot, therefore, be considered as modifications of the normal respiration; and nearly all of them are sounds which are generated in the air tubes by the passage of the air through them when contracted, or when containing fluid. In the first case they are termed dry, and in the second moist râles. They may obscure or entirely take the place of the natural murmurs, and they may have their seat in the upper air tubes or in the divisions of the bronchi. When occurring in the larynx or trachea, they are called tracheal râles; and when in the bronchial tubes, they are called bronchial; and as this is their most frequent location, the term râle means a bronchial râle, unless the location is specially indicated.

We distinguish the crepitant, sub-crepitant, coarse and gurgling râles.

The crepitant râle is heard in pneumonia, in phthisis and in dry pleurisy, and has a very dry, crackling sound, heard only at the end of inspiration, not in expiration. It is often necessary to make the applicant cough in order to develope this râle.

The sub-crepitant râle is heard in bronchitis, pneumonia, phthisis and œdema of the lungs, and is a fine, moist, bubbling sound, heard both in inspiration and expiration.

Coarse, mucous or bronchial râles are heard in acute and chronic bronchitis and phthisis.

Gurgling râles are heard only over small cavities, and usually in the bronchi of compressed lung, and are very coarse sounds having a peculiar gurgling character.

AUSCULTATION OF THE VOICE.

In auscultating the voice, we must notice the intensity, the pitch, the quality, the distinctness and the thrill.

1. *The Laryngeal Voice.*—This is heard over the larynx and trachea. The quality is laryngeal; the intensity great; the pitch high; distinctness and thrill are well marked.

2. *The Pulmonary Voice.*—This is heard over the lungs. Quality, pulmonary; intensity, feeble; pitch, low; not at all distinct; there is but a moderate thrill; the intensity and thrill are more marked in persons who

have a sonorous or vibrating voice. In the right infra-clavicular region, the intensity of the voice is usually greater, the pitch higher, and the thrill more marked than in the left.

3. *Increased Vocal Resonance.*—This is heard over lung consolidated by pneumonia; over cavities, over lung compressed by fluid, and over lung attached to the chest walls by old pleuritic adhesions, and sometimes in emphysema. The quality remains pulmonary; the intensity is increased; the pitch is higher, and the thrill is more marked.

4. *Diminished Vocal Resonance.*—This is heard over small collections of fluid with obstruction of the bronchi; over pleuritic adhesions, sometimes over consolidated lung; and the intensity and thrill of the voice are diminished.

5. *Suppressed Vocal Resonance.*—This occurs with large collections of fluid in the pleural cavities or thoracic tumors.

6. *Bronchophony* is heard over consolidated or compressed lung, and over cavities. In quality it is bronchial; the pitch is high; the intensity is variable; the distinctness is marked, and the thrill varies.

7. *Egophony* is a modified bronchophony, differing only in quality from it. It is heard over lung compressed by fluid just at the level of the fluid, and can only be heard well in persons who have a vibrating voice, and then even it is necessary to make them say some word which is of a vibratory character, such as "Brandt."

8. *Pectoriloquy.*—This is heard over cavities and over solidified lung, and can often be best appreciated when the applicant whispers, during which the sound of the voice and the articulation of the word is transmitted from the chest. It is quite a hollow or cavernous voice.

9. *Amphoric Voice.*—This is heard over large cavities and in hydro-pneumo-thorax. It is also found above the heart when the applicant whispers, and has a peculiar quality like that of amphoric breathing, while it resembles bronchophony.

The Metallic Tinkle.—This is usually a sign of pneumo-thorax after perforation of the lung, but may be heard over large cavities, and, while heard in the voice and the breathing, consists of a series of tinkling sounds of a high pitch or metallic tone.

EXAMINATION OF THE HEART.

This is effected by inspection, palpation, percussion and auscultation, and we examine the heart in reference to its size, its impulse, its movements, its normal sounds and its abormal sounds.

LOCATION.—In the healthy chest the auricles are in a line with the third costal cartilages, the right auricle extending across the sternum, a little beyond its right border; the left behind the pulmonary artery; the right ventricle lying partly behind the sternum and partly to the left, its

inferior border being on a level with the sixth cartilage; and the left ventricle mostly to the left of the sternum. As a whole, the heart extends vertically from the second space to the sixth costal cartilage, and in a transverse direction from about half an inch to the right of the sternum to within half an inch of the left nipple. The left ventricle, a large portion of the apex of the right ventricle, and the greater portion of the left auricle lie to the left of the sternum. Behind the sternum lie the greater portion of the right ventricle and auricle, and a small portion of the left. To the right of the sternum lie the upper portion of the right ventricle and a portion of the right auricle. The whole of the anterior surface of the heart, except a triangular space corresponding to the lower portion of the right ventricle, is overlapped by the lungs.

RELATIVE POSITION OF THE VALVES.

The mitral valve lies behind the cartilage of the fourth left rib, near the sternum.

The aortic valves lie behind the sternum, a little below the junction of the cartilages of the third ribs, and near its left edge.

The tricuspid valve lies behind the middle of the sternum, on a line with the articulations of the cartilages of the fourth ribs.

The pulmonary valves lie behind the junction of the sternum with the third left rib.

INSPECTION.

By inspection we note the exact point of the heart's impulse where it strikes the walls of the chest, whether there is any change in the form of the cardiac region; or whether there is any unusual pulsation. In some healthy persons there is a slight protrusion over the seat of the heart, and this prominence is marked when the heart is hypertrophied, or when fluid has accumulated in the pericardium. In the perfectly normal chest, the two sides are very nearly symmetrical, but in disease the præcordial region may be either depressed or arched forward, and the intercostal spaces widened. The depression at the lower part of the præcordial region may be natural, but if it is very marked, it is usually the result of pericardial inflammation. The most important feature in diagnosis furnished by inspection relates to the cardiac impulse. This is seen where the apex beats against the walls of the chest between the fifth and sixth ribs, about an inch inward from the nipple and an inch and a half downward.

In lean persons this is very distinct, while in corpulent persons it is not at all perceptible usually. It is changed by different positions, and by distention of the stomach after a full meal, by flatulence, and also in the act of expiration; for during a long-drawn inspiration, the extended lung presses the heart inward and the impulse is discernible in the epigastrum. while during a forced expiration, the beat moves upward and appears more

extended and diffused. In disease the changes produced are many. The heart is lifted upward and outward by the left lobe of an enlarged liver, and it is displaced by many effusions, notably the pericardial effusion. When the heart is enlarged, the impulse is visible lower down and over a larger surface. It may be crowded over to the right side and downwards by simple pleuritic effusion or emphysema, and in some cases of dilatation of the ventricles the underlying impulse will be visible.

PALPATION.

The hand, when laid on the præcordial region, can oftentimes feel impulses which cannot be seen. In many healthy persons the heart does not communicate any perceptible shock to the chest wall. The force of the impulse is temporarily increased by muscular exercise, by digestion and by sudden emotions, and also by any disease which depresses the vital forces. Fatty degeneration of the heart should diminish the force of the impulse, while dilatation of the ventricles, with hypertrophy, causes a heavy impulse over the whole præcordial region, instead of causing the circumscribed apex beat as in the normal chest. The force of the impulse is also increased by morbid functional excitement, by acute pericarditis and endocarditis, and especially by hypertrophy of the heart.

Besides the impulses, other phenomena may be studied by placing the hand over this region. The sounds of the heart may be analyzed by the different vibrations felt; one is a long and dull, and the other a short and distinct, vibration; these are both due to the action of the valves. In valvular lesion, if the fingers are applied over the heart, at times a peculiar thrill or purring movement is perceived, called by Laennec the "purring tremor."

Diminution of the impulse may depend upon feebleness of the action of the heart in consequence of the degeneration of its tissues, upon prostration of the whole system, or any condition which prevents the apex of the organ from impinging against the walls of the chest with its customary force, as happens in disease of the lungs and pericardium.

Increase in the impulse is usually caused by hypertrophy of the walls of the left ventricle, and to a slight degree is also found in the early stage of endocarditis, of pericarditis, and in palpitation from functional disorders.

The rhythm is, usually, in the normal heart perfectly regular, the heart contracting and dilating alternately in a perfectly regular way, the first and second sounds and the first and second silences following each other in regular sequence. In some healthy persons—and this must be remembered in connection with life insurance examinations—there is a regular intermission of the ventricular system, while in other persons the heart sounds are duplicated; either the systolic or diastolic sounds, or both of them, may be doubled, and such reduplication is said to be due to a want of synchronism between the action of the two sides of the heart. The

heart's action becomes irregular in rhythm in valvular disease, in dilatation and hypertrophy of the ventricles, in fatty degeneration, in pericarditis, in thrombosis of the heart, and from nervous influences.

PERCUSSION.

By percussion we determine the exact outline and size of the heart itself, and to do this perfectly the applicant should assume a recumbent position. Then, by a series of moderately strong taps, we proceed downward from near the middle of the clavicle until a dull sound, accompanied by decided resistance, tells us we are striking over the body of the organ, and this is usually at the lower border of the fourth cartilage, corresponding to the upper limit of the portion of the heart which is left uncovered by the lung. The superior border having been ascertained, we next percuss on the right side of the sternum on the level of the fifth rib, and across the bone, and over its left edge we find marked resistance and a duller sound, which marks that edge of the organ; we then proceed across the cardiac region up to the point at which a clear, full pulmonary note demonstrates that the full lung tissue is reached. The apex of the organ is readily obtained by advancing in an oblique direction from the already ascertained right border; but we can much more readily obtain this point by palpation.

The range of dullness may be increased by hypertrophy of the ventricles or dilatation of the cavities, or when the pericardium contains fluid, and may be diminished at the close of a full inspiration, or in pulmonary emphysema—in the latter case by the production of a general distention of the air cells. The area of deep-seated dullness is increased by enlargement of the heart, whether due to hypertrophy or to ventricular dilatation, and is apparently increased by consolidation of the anterior border of the lung, and also by fluid in the left pleural cavity.

AUSCULTATION.

The heart sounds should be first listened to while the person is breathing naturally, then while he is holding his breath, and finally during three or four forced inspirations. The examination should not be confined to the præcordial region alone, but the whole thoracic cavity should be explored in order to locate the points at which the heart sounds are heard with the greatest intensity, and the examination should be proceeded with from below upwards, and from left to right. When the ear or stethoscope is applied to the healthy præcordial region, two sounds of a very dissimilar character are detected. The first is long, dull, heavy and corresponds to the impulse against the walls of the chest; the second is short and occurs after the impulse. These are followed by an interval of silence which does not intervene between the first and second, but between the second and first.

These sounds are audible over the entire præcordial region, but with unequal distinctness, the first being best heard over the lower portion of the heart, and the second at the base. The first sound is softer, lower in pitch, and more prolonged than the second, and coincides with the systole of the ventricles and the apex beat, and has its maximum of intensity in the fifth interspace, a little to the right of the left nipple. The second sound is higher pitched, sharper, shorter, and more superficial than the first, and is synchronous with the diastole of the ventricles, occurring after the pulsation of the arteries, and has its maximum of intensity at the junction of the third left rib with the sternum. The period of silence immediately following the second sound varies in length with the rapidity of the heart's action.

The intensity of the heart sounds varies in health according to the force of its action, according to the conformation of the chest, and according to individual idiosyncrasies, being less in fleshy or muscular persons, with capacious chests, than in thin, narrow-chested, or nervous individuals.

The extent of surface over which the heart sounds are heard varies, but there is for each sound a point of maximum intensity, where it is heard with greatest distinctness, and from which point it gradually fades until it is lost, or marked by other sounds.

The sounds of the aorta are to be studied at the right edge of the sternum at the second intercostal space.

The mitral valve is listened to immediately above the beat of the apex; while the sounds of the tricuspid, or right ventricle, are to be sought for in the vicinity of the ensiform cartilage.

The modifications which the healthy sounds present when free from disease, in some cases resemble those due to morbid changes in the organ. They may be audible over a larger portion of the chest than usual, and they may be changed in character and rhythm. Their transmission over a larger space is unimportant, for, while they are undoubtedly more extended when the heart is enlarged, they are also more diffused when the surrounding tissues are condensed, and even in the most perfect health their range is very diversified. During a full inspiration, the sounds at the interspace between the second and third costal cartilages on the left side disappear almost entirely, and become faint at the aortic cartilage. In full expiration the first sound of the apex becomes much less distinct, although the extent over which the heart sounds are heard is increased. Functional disturbances of the heart cause the sounds of the organ to increase in distinctness, and with strong nervous excitement it becomes short, sharp, and sometimes loud and ringing. When the walls of the heart are thinned, the sounds are permanently louder than in health, and shorter and more clearly defined when the walls of the heart are thick. The first sound is apt to be dull and prolonged; if the structure of the heart be softened, the first sound is weakened; hence this symptom should lead the Examiner to suspect fatty degeneration, or thickening of the

mitral and tricuspid valves, or a want of tonicity in the muscles of the organ. The second sound is not so liable to be changed as the first; a thickening of the semi-lunar valves renders it somewhat duller; or if they are abnormally thin, or in cases of great functional excitement of the heart, the sound is rendered more perceptible; this is especially notable in some cases of hypertrophy of the ventricles, and also takes place where a decided obstruction exists to the passage of blood through the lungs. In this case, this accentuated second sound is audible over the pulmonary artery alone.

When the sounds are obscure, the Examiner should suspect the accumulation of fluid in the pericardium. In irregular action of the heart, which is apt to be associated with organic disease but may exist without it, the sounds are apt to be changed in the relative proportion to each other, and the pauses between them may be lengthened or shortened, or the sounds may intermit.

HEART MURMURS.

Murmurs are sounds mainly produced either within the heart or on its surface, and the term has been applied to those adventitious sounds which accompany or replace the normal sounds of the heart, and which are not heard in health. Their seat may be at the orifices of the ventricles, when they are called valvular or endocardial murmurs, or they may be within the heart, or they may be external and in the pericardium, when they are termed exocardial or pericardial friction sounds. Those that are endocardial have a common quality in that they are all more or less blowing, although the sound is not always of the same character or pitch, and they are not at all times the same in the same case, since the heart when excited may emit a sound different from that which it does when beating quietly. This blowing sound originates from the altered relation of the blood to the part over which it moves. Most usually a cardiac murmur springs from a change at one of the orifices owing to the narrowing or roughening of the aperture, which interposes local obstruction to the flow of the blood; or it may be due to insufficient closing of the valves. In the latter case, the blood regurgitates and the murmur is occasioned by the change in the circulation of the current of blood within the heart.

There are two sources of error for which the Examiner should be on his guard. First, these blowing sounds are not infrequently present when the heart is violently excited, when both its valvular parts and muscular textures are healthy. Second, when altered blood causes the murmur.

Murmurs correspond in the time of their occurrence to the contraction or dilatation of the heart, and, therefore, to the first or second sound; at least, this, for the ordinary purposes of examination, is sufficiently accurate. It is often difficult, and sometimes impossible, to say whether a murmur is either systolic or diastolic; the readiest method of determining this being to feel for the impulse with the fingers while listening to the murmur, the

blowing sound corresponding to the beat of the heart being systolic, and the one between the beats of the heart, diastolic. A murmur once established is not always equally perceptible, sometimes becoming very faint, or disappearing entirely by the change in position on the part of the applicant; and sometimes is only manifest when the heart is acting forcibly. Posture exercises a very decided effect on murmurs. The blowing sound is distinct in a recumbent posture, becoming very faint, or disappearing entirely, when the applicant stands erect; or the reverse is the case.

A source of error is the resemblance between the natural respiratory sounds of the lungs and the blowing sounds of the heart, but a distinction may be readily made when the applicant suspends breathing. To determine the seat of a murmur, we must ascertain the point of its greatest intensity. The murmur produced at the mitral orifice is heard most distinctly at, or near the apex of the heart; if generated in the right ventricle or at the tricuspid opening, it is heard immediately above the ensiform cartilage; if developed at the origin of the aorta, it is heard most plainly at the sternum, somewhat toward its left border, on a level with the third intercostal space or the fourth rib, and with nearly equal distinctness over the second costal cartilage on the right side. The pulmonary artery is not often the seat of a murmur, but when it is, it is clearly perceptible in the second intercostal space on the right side, and extends to the junction of the third left cartilage with the sternum.

It is very important to examine each portion of the heart separately, since the sounds of valvular disease may coexist in the greater portion of the heart, but the greater intensity of the sounds of one portion of the valves may obscure the location of the others. When satisfied as to the seat of a murmur, we naturally turn to inquire into its origin, and there is nothing in the murmur itself which will tell us positively whether it is caused by an alteration of the fluids or connected with any appreciable change in the structure of the heart. As a rule, a harsh murmur results from organic disease, and a soft murmur from functional disease, but there are many exceptions, and we can judge with more certainty from the time of the blowing sound. A murmur attending distention of the heart indicates injury of the orifices; while a murmur occurring during the contraction may indicate simply a change in the state of the blood and in the force and velocity with which it is circulating; but in the latter case, the abnormal sound is temporary and disappears with the excitement. When arising from an impoverished state of the blood, it is generally soft, of low pitch, accompanied with a humming sound in the veins of the neck, and is present over the base of the heart.

It is a great mistake to suppose that every murmur heard over arteries is connected with disease of the heart, as it is frequently from impoverished blood, and it is even stated that pressure of a healthy heart may generate a murmur. To describe more in detail the murmurs of the interior of the

heart, the elements of quality and intensity hold a subordinate place, for the same murmur at different times may be grating, rubbing, blowing or muscular in character, without its significance being altered by any of these changes in quality.

The precise pathological significance of endocardial murmurs is apparent from the following table, taken from Loomis:

TABLE OF CARDIAC MURMURS.

Periods of Heart's Action.	Seat of Murmur.		Cause of Murmur.
SYSTOLIC.	Left side of heart.	Aortic.	Obstruction to the onward flow of blood through the aortic orifice, or through the aorta.
		Mitral.	Regurgitation of blood through the mitral valve into the left auricle.
	Right side of heart.	Pulmonary.	Obstruction to the onward flow of blood through pulmonary orifice, or through pulmonary artery.
		Tricuspid.	Regurgitation of blood through the tricuspid orifice into right auricle.
DIASTOLIC	Left side of heart	Aortic.	Regurgitation of blood through the aortic orifice into left ventricle.
		Mitral.	Obstruction to the flow of blood from left auricle to left ventricle.
	Right side of heart.	Pulmonary.	Regurgitation of blood through the pulmonary orifice into right ventricle.
		Tricuspid.	Obstruction to flow of blood from right auricle into right ventricle.

The sounds which originate on the outside of the heart, or pericardial murmurs, result from irregularities of the surfaces of the pericardium; the smooth, serous covering of the heart, while roughened by deposit of any kind, gives rise during movement to a sound which may be single, but is more usually double, and in character is very variable; it may be a distinct to and fro rubbing murmur, or may be scratching, grating or whistling, but has one quality which is constant and diagnostic, although it is often difficult in spite of this to distinguish the friction. The sound, too, is apt to mask the sounds of the heart, and it is not at all times, although heard over the cardiac region, due to inflammation of the pericardium, for the exudation may be on the surface of the pleura adjacent to the pericardium, and the murmur be caused solely by the movements of the heart; and, again, the sound heard in the pericardial region is in reality the rubbing of an inflamed pleura; but in this case, if the person suspends breathing, the pleural sounds cease. There are also some sounds produced by the action of the heart, which are neither cardial nor pericardial; these sounds are mostly systolic and inspiratory, and usually cease with cessation of the respiratory movements.

EXAMINATION OF THE PULSE.

THE PULSE.

THE pulse, when felt by the tips of the fingers at the wrist, or elsewhere, registers the change in the fullness or distention of the artery, as the blood is forced through the systemic circulation by the contraction of the heart. The best way to measure this fullness, or tension of the pulse, is to compress the artery with the index finger, while the two adjoining finger tips placed more distant from the heart, register the amount of pressure necessary to stop the flow of blood.

THE SPHYGMOGRAPH is an instrument which registers the various qualities of the pulse by means of tracings on a diagram. From an analysis of these we perceive, that what may appear simple to the sense of touch, is really a complicated phenomenon, requiring careful study.

PULSE TRACINGS.—The sphygmograph demonstrates that the movement of the artery is a compound of three waves, called the summit wave, the tidal wave and the dicrotism.

The summit wave, which caps the line of ascent of the trace, is due to the sudden vibration in the blood column, immediately following the lifting of the aortic valves by the discharge of blood from the left ventricle.

The tidal, impletion, or small secondary wave, is due to the distention of the arteries, following the increased pressure in the aorta and great arteries from the sudden influx of the ventricular contents.

The dicrotism, or great secondary wave, is an oscillation of the current of blood in the arteries, mainly produced by the recoil of the blood column from the quick closure of the aortic valves.

TYPICAL PULSE TRACING.—(See fig. 1.) A pulse trace consists in a line of ascent, *a* to *b*, ending in the summit wave *b*, and corresponding with the first part of the ventricular systole. From the summit wave the line falls until it is again raised by the tidal wave, due to the impletion of the vessel. After the tidal wave, a more marked descent occurs, called the aortic notch *c*, and the line again raises into the dicrotic wave *d*.

The line of descent from *b* to *a'* is then broken by two waves and two notches. The two waves have been described; of the two notches, one precedes the tidal wave and indicates a slight collapse in the arterial wall after the oscillation, called the summit wave; while the other, called the

aortic notch, precedes the dicrotic wave, and marks the fall in pressure on the arteries antecedent to the closure of the aortic valves.

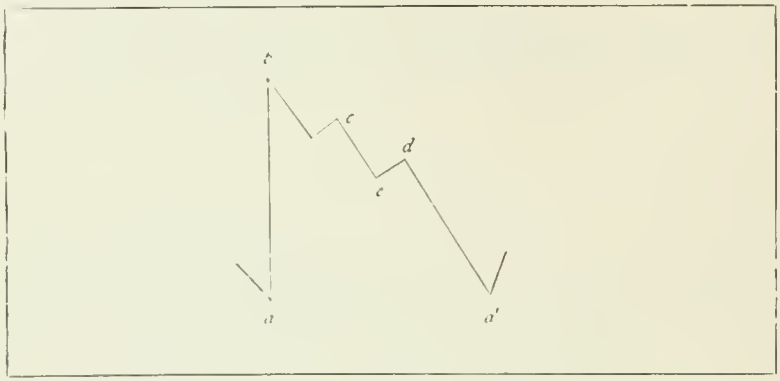


Fig. 1.—Typical pulse trace: *a* to *b*, line of ascent; *b* to *a'*, line of descent; *b*, summit wave; *c*, tidal wave; *d*, dicrotic wave, or dicrotism; *e*, aortic notch.

The instant the aortic valves close, the line is interrupted again. It is the bottom of this aortic notch, marking the closure of the aortic valves, which indicates the end of the ventricular systole. The rest of the line of descent corresponds with the diastole of the ventricle.

MODIFIED PULSE TRACINGS.—The pulse trace is modified by the state of arterial fullness, or tension.

High tension is denoted thus—The line of ascent is less lofty; the tidal wave is large and often blended with the summit wave; the aortic notch is shallow; the dicrotism not much developed, and the line of descent is more gradual.

Low tension.—The line of ascent is lofty; the summit wave distinct; tidal wave small; the aortic notch deep; the dicrotism highly developed, and the line of descent sudden.

In arterial degenerations, when the normal elasticity of the arteries is lost, these modifications are interfered with.

The rate, rhythm and force of the pulse depend upon the heart.

The art of feeling the pulse consists in discovering, through the sensation of feeling, the condition of the heart, arteries and blood.

A hard, cord-like artery indicates degeneration or senile changes.

FREQUENCY OF THE PULSE depends on the rate of the cardiac contractions. This rate varies with age, position of the body, sex, stature and other physical or psychical influences. In the newly born infant the pulse beats from 130 to 140 per minute, but the rate gradually falls, until after the sixth year it is under 100. Up to the age of maturity, there is a further decrease of thirty beats to about seventy per minute. In old age the rate often rises slightly.

Postures.—The pulse is slowest in the recumbent position; sitting, it is five beats faster; and standing, it is ten beats faster in the male and seven in the female.

Sex.—The female of seven years has about ten pulse-beats a minute more than a male of the same age.

Stature.—Persons six feet in height have a pulse three or four beats slower than men five and one-half feet high.

NORMAL PULSE-BEATS PER MINUTE.

	Males.	Females.
Youth	80 to 90	80 to 95
Adult	70 to 80	75 to 85
Middle life	60 to 80	60 to 85
Advanced life	75 to 85	75 to 90

Increased frequency in health is occasioned by any kind of exercise; mental emotion or nervous excitement; a full meal; it is higher in the evening than in the morning; when awake than asleep. In disease a quick pulse may be one of its first indications, as in fevers, debility, chronic valvular affections of the heart, nervous disorders, intemperance, etc.

The jerky pulse is a hurried beat followed by an abrupt stop, and indicates defect in the aortic valves, or some nervous affection. The water-hammer pulse denotes aortic regurgitation.

Diminished frequency of pulse rate is not common. It is seen in some of the blood diseases, jaundice, anæmia, diabetes, convalescence from pneumonia, in relapsing fever, fatty degeneration of the heart, in some nervous affections, especially of the medulla oblongata, wherein it has fallen to about twenty beats per minute; in tumors pressing on the aorta or arteries; in diseases of a depressing nature.

RHYTHM OF THE PULSE.—Depends on the action of the heart. Variations are of two kinds, intermittence and irregularity.

THE INTERMITTENT PULSE means the omission of a beat occasionally. Intermittences may occur regularly, say every twentieth beat, or irregularly, and are met with more frequently among the old than the young, in some cases being unassociated with organic diseases.

Causes.—It may be caused, temporarily, by nervous excitement; in other cases, by hypochondriasis, dyspepsia, excessive use of tobacco or narcotics and stimulants, gout, over-work, fatty degeneration of the heart, or some cardiac neuroses. It may be the first symptom of oncoming malignant disease. In some persons, especially the old, it is habitual, though they are otherwise healthy.

THE IRREGULAR PULSE presents itself in two forms—irregularity in frequency and irregularity in force, or inequality. The two are frequently

associated, no two pulsations being equal in force, or succeeding each other at equal intervals. In other cases a number of steady beats, regular in frequency and force, may be followed by a disorderly series, unequal and irregular.

Diseases of the mitral valve and cardiac dilatation usually exhibit these abnormalities, although they are incident to any form of heart disease.

Mitral insufficiency affords common examples of unequal and irregular pulse, though the beats may be only slightly unequal in size and form, but perfectly regular in the periodicity of their occurrence.

In mitral stenosis, irregularity and intermissions are usually associated with inequality. Intermissions are called false when the ventricular systole is too weak to make them apparent at the wrist.

Exercise increases these abnormalities of pulse in mitral diseases.

Inequality in the size of pulsations often depends on respiratory influences. Deep inspiration reduces arterial tension, lessens the size of and quickens the pulse. Extreme expiration raises the tension, increases the size of and slows the pulse.

The suppressed pulse sometimes occurs in one or all of the arteries. When general, it is due to cardiac weakness; when partial, to either compression, thrombosis or aneurism of the main artery.

The retarded pulse is where the pulsation occurs later in one artery than in another, and usually indicates aneurism.

THE FORCE OF THE PULSE is the product of the heart's vigor, and is estimated by the finger by the amount of force required to obliterate it; and by the sphygmograph by the pressure required to develop a typical tracing.

The state of the smaller blood vessels regulates the distribution of this cardiac force.

A soft, compressible pulse results from the small amount of blood retained in the artery when it is relaxed, and a vigorous heart quickly distributes its force over the whole vascular area.

A hard and incompressible pulse results from fullness of the artery with blood under high pressure, when the arterioles are contracted and the heart's force is retained in the arteries.

The force of the pulse is thus modified by the state of the peripheral circulation; the vascular tension being in inverse proportion to the frequency and suddenness of the heart's action.

OTHER VARIETIES OF PULSE.—The size of the pulse is determined by the volume of blood expelled by the ventricle and the fullness of the arteries. A hard and wiry pulse accompanies contracted arteries; a large and soft pulse occurs when their walls are relaxed.

The flickering pulse indicates feeble and unequal contractions of the ventricles. An undulatory, weak pulse is due to the influence of respiration, which varies the tension.

The sudden pulse is shown on the tracing of the sphygmograph by a nearly vertical line of ascent, resulting from quick ventricular systole.

The gradual pulse has an oblique line of ascent, and results from slow ventricular systole.

VARIETIES OF HARD PULSE.—(1) The hard, frequent, sudden and small pulse, found in peritonitis, enteritis and pericarditis. (2.) The hard, slow, gradual and large pulse of contracted kidney. (3) The hard, large, often gradual pulse of cardiac hypertrophy and degeneration of blood vessels. (4.) The hard, sudden, jerky, large and vibratory pulse of aortic insufficiency, with strong ventricle.

VARIETIES OF SOFT PULSE.—(1.) The soft, frequent pulse of pyrexia; dicrotous and hyper-dicrotous pulses. (2.) The soft, frequent and large pulse of rheumatic fever. (3.) The soft, small, frequent and sudden pulse of debility. (4.) The soft, frequent and small (running) pulse of collapse in fever.

ANOMALIES OF PULSE are sometimes due to irregular distribution of the arteries. The radial artery may lie deep, or be so small as not to be felt readily. In those cases other arteries must be tested to show any of the foregoing qualities of pulse.

REMARKS.—At the present stage of scientific research, the pulse indicates the condition of the nervous, as well as the circulatory system, and the subject should be mastered by the Medical Examiner. Unless absolute disease is the cause, many abnormalities of pulse are individual idiosyncrasies, and need not debar from insurance; but all such cases should be stated plainly in the application. The pulse rate, when below sixty or above ninety per minute in the adult, deserves critical analysis, and, at least, postponement of judgment.

EXAMINATION OF THE ABDOMEN.

The physical exploration of the abdomen does not yield such perfect results as when this method of diagnosis is applied effectually to the thorax, but still the knowledge thus gained is often most valuable.

THE METHODS OF PHYSICAL DIAGNOSIS.

INSPECTION.—By inspection we learn the shape, size, form and movements, and to inspect the abdomen satisfactorily, the applicant may be either standing or sitting; as a rule, a recumbent posture being less eligible.

It is necessary to remember that even in health the appearance of the abdominal walls is modified by certain physiological conditions. It is more voluminous in females—especially such as have given birth to several children—than in males. It increases in size in advancing years, particularly when the applicant exhibits a tendency to obesity, and the upper portion is more distended after a copious meal than when the stomach is in an

empty state. In diseased conditions, we may have either a partial or general enlargement of the abdomen. The latter may be caused by accumulations of air in the intestines, or by fluids or tumors in the peritoneal cavity, while a partial enlargement may be produced by an increase in the size of the liver or spleen, or by induration or swelling of the mesenteric glands, or by solid tumors or hernia, or by abnormal conditions above the diaphragm. A pleuritic or pericardial effusion, or even emphysema of the lungs, may give rise to a marked fullness below the margin of the ribs.

Retraction of the abdominal parietes is observed in general emaciation, especially when dependent upon chronic diarrhœa or dysentery, or upon a narrowing of the cardiac orifice of the stomach. It may be also noticed in lead colic and syphilitic diseases. When the superficial veins are distended, we suspect an obstruction to the flow of blood in the large veins of the abdomen, either in the portal system or the vena cava. When the depression of the umbilicus is diminished, it is usually a sign indicative of general abdominal enlargement. Movements of the abdomen during inspiration may be of different kinds. When a tumor or any other impediment interferes with the free action of the diaphragm, the act of breathing gives rise to a motion which is very slight. This movement is much exaggerated by diseases within the thorax. The rolling of the intestines is sometimes visible externally, and also the spasmodic contraction and relaxation of the abdominal muscles, together with the shiftings of the accumulations of gas, which give rise to a series of jerking elevations. A pulsation mainly in the epigastric region is sometimes observed, which is not infrequently mistaken for aneurism.

MENSURATION is mainly useful in determining the exact increase or decrease of abdominal dropsies, visceral enlargements, tumors and corpulency.

PALPATION.—By this method of examination we can judge of the size, position and consistence of the viscera, which are felt through the abdominal walls, and can determine whether the parts are firmly attached or movable, and whether or not they possess an independent motion; we can also ascertain whether they are tender or not, and can detect the peculiar feeling of fluctuation attending the presence of fluid in the abdominal cavity. We can also by the sense of touch determine the state of the parietes, whether hot or cold, resistant or elastic or œdematous.

When palpation is practiced, the abdominal muscles should be relaxed. In order to do this effectually, the applicant should be placed on the back and the thighs flexed on the body, although this position may be varied by turning him from side to side or examining him erectly. The character and intensity of the pain which the pressure calls forth is a diagnostic sign of considerable value. If deep pressure produces pain, we may usually consider that the disease is deeply seated, while neuralgic or nervous pain, such as that of colic, may be relieved rather than increased by pressure. These symptoms are rarely met with in applicants for life insurance, as they are

usually in a state of health; it is not usual to have an applicant appear for examination in acute stages of abdominal disease, to which these rules would apply.

By palpation we determine the size and position of the viscera, the existence of swellings and tumors, whether deep or superficial, small or large, hard or soft, elongated or smooth, and whether or not they possess independent motion.

PERCUSSION.—Percussion is perhaps even more valuable as a means of diagnosis than palpation, for by it we can map out the different organs with accuracy, judging of the position of the stomach and the intestines, fixing the boundaries of the distended bladder and the borders of the liver and spleen. We can also tell whether a distention of the abdomen is produced by a solid tumor, a liquid, or by air. The applicant should be placed in the same position as for palpation.

The liver is one of the most important organs to examine; its upper boundary is determined by percussing with moderate force in a line from somewhat above the right nipple to the lower part of the thorax, until marked dullness and resistance demonstrate that a solid organ has been reached; this corresponds to the upper border of the liver; anteriorly, it extends from the lower extremity of the sternum to between the fifth and sixth ribs. At the side it is generally found in the seventh intercostal space, while near the vertebral column it is ordinarily on a level with the tenth, eleventh or the ninth interspace. The dullness of the left lobe reaches nearly two inches across the median line, but it is difficult to distinguish the flat sound of the liver from the flat sound of the heart, lying so near it.

The inferior margin of the liver is determined by percussing downward from the already ascertained line of dullness until the distinct tympanitic sound of the large intestine is elicited.

Anteriorly, the inferior border of the liver will usually be found to be immediately on or to project below the last rib. Posteriorly, this border cannot be determined positively, for it becomes continuous in the dullness occasioned by the presence of the right kidney; but the lower margin of the left lobe is usually met with at the upper part of the line drawn from the umbilicus to the ensiform cartilage, although a much distended bladder may cause a strictly defined dullness lower than the dullness of the surrounding liver.

The percussion sound elicited over a healthy abdomen may be tympanitic, dull, or flat. Over the central portion of the liver, kidneys and spleen, the percussion sound is flat, while over that portion in which the intestine or stomach is overlapped by them, it is dull, with a tympanitic quality; over the stomach and intestines it is tympanitic; if a fluid occupies the abdominal cavity, the percussion sound will be flat. The percussion flatness is unnatural and increased over a distended bladder or uterus,

an enlarged spleen, kidney, mesenteric gland or liver, and over ovarian, aneurismal and other tumors, while an increased area of tympanitic resonance is found in gaseous distention of the stomach and intestines.

The spleen is not as easily mapped out as the liver, for if the stomach contains much fluid, or if the intestines be distended with gas, it is very difficult to determine the dull sound of the spleen. To map out this organ, the applicant should be placed on the right side with his legs flexed, or he should stand erect, and the percussion should be practiced with considerable force in a line from the axilla to the crest of the ilium. Its upper boundary is usually to be found at the ninth or sometimes at the tenth rib, and its lower at or about the twelfth rib; its lateral borders are usually determined by percussing from the median line to a point between the lines which mark the superior and inferior margins; but posteriorly, we cannot define the border of the spleen accurately, because its dullness becomes continuous with that of the left kidney. The average size of the spleen is four inches in length and three in width, but it is increased materialy in a diseased state, and this should be noted in applicants who have suffered from malaria to any marked degree.

The kidneys cannot be mapped out with any degree of accuracy by percussion except as to their inferior or outer borders, so it is useless to consider that question here.

The stomach, when not distended unusually with gas or food, renders a sound which is ringing, hollow or tympanitic to a certain degree, although not to the same extent as the intestine. To determine its boundaries it is necessary, first to mark out the lower margin of the liver, then the heart and the inner border of the spleen.

The cardiac extremity of the stomach is situated near the left of the apex of the heart, about opposite the seventh rib; its lower border is ascertained by percussing in a downward direction till the colon is reached. The colon itself yields on percussion a sound of a more tympanitic character than the stomach, and the sound may be said to be rather amphoric than tympanitic. The small intestines, unless filled with solids or fluids, or distended with gas, render a sound of higher pitch and smaller volume than the colon, and by this deep-toned sound their position may be accurately determined.

AUSCULTATION.—This is often interfered with, and its results rendered uncertain, by changes occurring in the abdominal walls. If a layer of fat exists, as in some cases of obesity, auscultation would be very unsatisfactory, and also in an œdematous condition, as in Bright's disease; in this, the surface of the abdomen usually presents a smooth, shining, white appearance. The abdominal muscles are also sometimes abnormally developed, thereby interfering with examination; but auscultation is occasionally serviceable in aiding in the detection of abdominal aneurism, or we may hear a friction sound from the presence of a roughened peritoneum, or an

enlarged spleen may give rise to a distended, blowing murmur; but, as a rule, it is a diagnostic procedure that is rarely necessary or of value.

EXAMINATION OF THE URINE.

The examination of urine is of great service in the diagnosis of diseased conditions, and is accomplished by chemical and microscopical means.

CHEMICAL EXAMINATION.

The specimen to be examined should be collected in a perfectly clean receptacle; should be passed in the presence of the Examiner, and examined with reference to, 1st, its general appearance and color; 2d, its odor; 3d, the quantity passed in twenty-four hours; 4th, the reaction; 5th, its specific gravity; 6th, the presence or absence of albumin; 7th, the presence or absence of sugar; 8th, the microscopical appearances.

GENERAL APPEARANCE AND COLOR.—This varies considerably even in health, and is much affected by food and medicine, and also by various morbid processes. If of a smoky or red aspect, it should lead us to suspect the admixture of blood; or if highly colored, uric acid; a very light color usually denotes an increase of water, as in diabetes, hysteria or nervous affections; or if green, yellow or brown, bile should be suspected, although very much the same tint is imparted to the urine if the applicant has been taking rhubarb. The color is deepened if the applicant has been drinking strong coffee; a violet color is imparted to it if the applicant has been taking turpentine; and a yellow color from taking senna; while disintegrated blood renders it black. In health, the color usually varies from a pale straw to a brownish yellow. Highly colored urine usually indicates the existence of some pathological condition, and generally leads us to suspect organic disease of the liver, or some inflammatory disease, if not due to an excess of uric acid or urates. The presence of bile, which is indicated by a dark olive tint in the urine, may be rendered certain by a small quantity of nitric acid, for as soon as the two fluids are brought in contact, the drop of acid will be fringed with a beautiful display of colors, green, violet and red, which will rapidly disappear.

ODOR.—Normal urine, immediately after being voided, possesses a sweetish, aromatic odor, but many kinds of food and drink transmit to it their characteristics, as, for instance, asparagus, which is recognized by everyone. Bright's disease, jaundice, diabetes, and certain affections of the bladder, change the odor of the urine, each having its distinctive character.

QUANTITY PASSED IN TWENTY-FOUR HOURS.—This in healthy persons varies greatly, the mean daily discharge ranging between forty and fifty ounces, this variation depending greatly on the quantity of fluid taken into the system and whether the skin and bowels are normal in their action. To determine the quantity accurately, the urine should be carefully measured in

a graduated glass. When unusually scanty, if the applicant has not abstained from liquids above his habit, and if the water has not been eliminated in excess by some other channel, as by the skin or bowels, we must suspect cirrhosis of the liver, some forms of Bright's disease, or some condition of the heart which, directly or indirectly, causes passive congestion of the renal veins, whereby the renal circulation is impeded. If the flow of urine is unusually abundant, and not caused by the cooling of the surface of the body, or by the taking of large quantities of fluid into the system, it is usually indicative of one of two maladies, diabetes or atrophic degeneration of the kidneys, although a temporary excess of urine occurs in hysterical paroxysms, and other convulsive attacks in both males and females. An increased tension in the arterial system, such as is frequently found in hypertrophy of the left ventricle, is also very frequently the cause of increased secretion of urine.

REACTION.—The reaction of urine is usually ascertained by means of litmus paper. If acid, it reddens blue litmus paper, and if alkaline, it renders red litmus paper blue.

Healthy urine is usually highly acid when first passed, but, after standing for a certain time, all urine becomes alkaline. The urine is abnormally acid in febrile and inflammatory affections, especially of the heart, lungs and liver, and is usually strongly alkaline in some diseases of the genito-urinary organs, and in affections of the brain and spinal cord. The degree of acidity, even in health, is not always equal, and is much influenced by digestion. If no food has been taken for hours, the discharge is highly acid, while that passed just after a meal, during the process of digestion, is but faintly so, and may be neutral, or even alkaline.

SPECIFIC GRAVITY.*—Specific gravity of healthy urine ranges between 1.012 and 1.030, the average being about 1.020; it is highest soon after eating, and lowest after large quantities of fluid have been taken.

The most convenient method for estimating the specific gravity is by means of the urinometer, an instrument consisting of a blown glass float, terminating inferiorly in a small bulb containing mercury, and superiorly in a stem which is graduated. The average specific gravity of urine is increased or diminished in disease. It is highest in diabetes and lowest in hysteria.

* Medical Examiners in their report to the home office should be careful to designate the kind of urinometer employed, as instruments differ greatly. For instance, the ordinary English urinometer is divided into degrees running from 1000 to 1060, while there is a German (Newbaun & Vogel) urinometer graduated from 1000 to 1040, and still another (Heller's) running from 1000 to about 1007 It will be noticeable that there is a great difference in this regard. Thus one degree of Heller's urinometer corresponds to seven degrees of the English ; therefore, if we have a specific gravity of the urine of 1003 Heller, we may translate the same into the English standard by stating that the urine has a specific gravity of 1.021 Or, if it is 1004 Heller, we have 1.028 English. In this latter case an examination for sugar should be made, while in the former no such examination is required.

When abnormally low, some exhausting non-inflammatory complaint, such as Bright's disease, is to be suspected unless large quantities of fluid, such as water or beer, have been recently taken. In such cases, postpone the applicant until a more favorable specimen of urine can be passed. The Examiner should not accept an applicant whose urine is below 1.010 in specific gravity at the time of the examination, and all urine of persistent low specific gravity should be carefully examined chemically and microscopically.

ALBUMEN.

ALBUMINURIA is the diseased condition of the system indicated by the presence of albumen in the urine. Albuminous matters are found in the urine of those suffering from spermatorrhœa, pyuria, hæmaturia, hæmatinuria, etc. Albuminuria, especially of the temporary type, may occur independently of organic diseases of the kidneys or any other organ, although it always exists in Bright's disease at some stage. It sometimes exists without objective symptoms; but, as a rule, the chronic form is accompanied by a pasty complexion and dry skin, with œdema of the eyelids and cellular tissue of the lower extremities; digestive troubles, such as nausea, flatulence and constipation; nervous disorders, with headache, lassitude and muscular weakness; frequent micturition at night and palpitation of the heart. It often follows congestion of the kidneys in inflammatory diseases, such as measles, scarlet fever, smallpox, typhoid and malarial fevers, pneumonia, diphtheria, rheumatism, peritonitis, etc. It is found in emphysema, cirrhosis of the liver, organic heart disease, pregnancy, and abdominal tumors when the circulation of the blood is obstructed, and an impoverished state of the blood, such as exists in anæmia, pyæmia and scurvy, often gives rise to it.

HEAT AND NITRIC ACID TEST.—(See Part I., Urine Examination, for another test.) This test is sufficiently accurate for the purposes of life insurance if it is properly done. Take a drachm or two of fresh urine; if cloudy, filter through clean sand or filter-paper; boil first and then add a drop of dilute acid to make sure that the reaction is acid; for heat does not precipitate albumen in alkaline urine, and too much acid will cause the same result, because, in the first instance, heat may form alkali albumen, and in the second acid albumen, both of which are soluble in the urine. If the urine remains cloudy after this test, albumen is present, and the addition of an excess of acid will not dissolve it.

The precipitate caused by excess of urates will disappear by boiling, and that caused by phosphates is dissolved by the nitric acid.

THE NITRIC ACID, OR HELLER'S TEST, has been adopted by the Clinical Society of London, as the most reliable and delicate. *The Medical Record* of New York, in its issue of April 30, 1887, published a most interesting paper on the tests for albumen, by Dr. H. B. Millard, which was read and discussed before the New York Academy of Medicine. Put a drachm

of pure, colorless nitric acid in a clean test-tube measuring three-quarters of an inch in diameter. Incline the test-tube at an angle of forty-five degrees, and allow an equal quantity of filtered urine to slowly trickle down upon the acid from the pipette. The urine must overlie the acid. If albumen be present, it is quickly coagulated by contact with the acid and a white, lardaceous layer, varying in thickness according to the quantity of albumen, is formed at the line of junction. When the quantity of albumen is small, it may be necessary to allow the tube to stand a quarter or half an hour before the white zone is distinguishable. If the urine be allowed to cool, four distinct zones: first the lower one, orange colored; next the albuminous layer; then the urates, and the upper one, composed of mucin, can be distinguished.

THE NITRIC MAGNESIAN TEST is a modification, by Dr. Sir William Roberts, of the pure nitric acid test, and is described in an article by him, published in the *Medical Chronicle*, of London, October, 1884. It is prepared by mixing one part of pure nitric acid with five parts of a saturated solution of the sulphate of magnesia, and filtering. It is used the same as the former test, and is recommended as a very delicate one. It is one-third more delicate than the pure nitric acid test, showing one part in 150,000, where the latter shows one in 100,000. It also condenses the layer of albumen, so that an estimate of the percentage of albumen present can be more readily made.

REMARKS.—The other tests for albumen can be found in any medical text-book; but the first one mentioned is sufficiently accurate, since it indicates one part in 100,000. When the urine* contains sugar as well as albu-

* URINE EXAMINATION IN LIFE INSURANCE is the title of an article published in the *St. Louis Medical and Surgical Journal* for April, 1887, from the pen of Dr. Wm. J. Lewis, Consulting Surgeon of the Travelers Insurance Company of Hartford Conn. He concludes that the value of such examinations, from a financial (the company's) standpoint, as well as a scientific point of view, appears to be limited Dr Lewis concludes: "From the large expense attendant upon such examinations; the impossibility of obtaining a correct analysis in the majority of cases; the small percentage of deaths from genito-urinary diseases, even when no such examination has been required; and the objection on the part of the applicant to submit to the ordeal, insurance companies might infer that they have little to gain and much to lose by making it a prerequisite for insurance in all cases. On the other hand, when large amounts are involved, or when some symptom is present to indicate a suspicion of abnormal urine, extra precaution, by requiring an analysis, becomes necessary."

Nevertheless, we venture to say, that the number of companies and Medical Examiners willing to forego a urinary examination, is growing less and less every year, because it is so valuable as a corroborative test of the value of coexisting symptoms of albuminuria, diabetes, etc Few Examiners would care to predicate the existence of albuminuria and diabetes, when the urinary analysis reveals the absence of albumen and sugar; and *vice versa*, when the proper tests demonstrate the presence of these abnormal ingredients, where is the medical officer who would make it his habit to recommend such cases to his company for insurance, even though there were no other signs of either of those diseases? As these urinary tests become more generally required and more accurately performed, it seems probable that the mortality of the insured from diseases of the genito-urinary organs will be still further reduced.

min, it must first be boiled to precipitate the albumin, then filtered to separate it, after which the test for sugar may be made.

It is well to remember that sugar or albumin, when discovered in the urine, are not necessarily indicative of fatal diseases, such as diabetes or Bright's disease.

They may be the results, simply, of some functional disturbance.

Cases in which these conditions are found should be postponed for further and repeated examinations. But if constantly present, the applicant should be rejected.

In either case it would be well to supplement the chemical by a microscopical examination, so as to remove all elements of doubt as nearly as possible.

In the early period of life insurance it was not customary to examine the urine, except when the physical signs pointed to the existence of Bright's disease or diabetes. Afterwards it became the custom to examine it when the amount of insurance applied for reached a certain limit. At the present time the condition of the urine is investigated in almost all cases, irrespective of the amount of insurance applied for, and the microscope is also often called into requisition. It is neither fair nor reasonable to reject an applicant, and, as it were, to pass sentence of death upon him, merely because one test-tube examination has shown that the urine contains a certain amount of albumin. The albuminuria may be simply functional, or it may be what is called cyclic, and in neither case be a symptom of Bright's disease. On the other hand, it is a well-known fact that chronic renal disease may exist while the urine, as far as the results of a mere test-tube examination go, gives no indication of its existence. The corrective of the test-tube examination, is the microscopical investigation. If tube-casts and other microscopical evidences of chronic nephritis be found, then the suspicion aroused by the chemical test will be confirmed.

SUGAR.

The detection of sugar in the urine does not always indicate the existence of diabetes or kidney disease, and it is maintained by many authorities—among whom was the late Prof. J. W. Draper—that it is a common ingredient, and that it is often found after an excess of saccharine or starchy food has been taken, or after the use of chloroform, ether, turpentine, etc. In many diseases there are small quantities of sugar detected in the urine—in whooping cough, asthma, epilepsy, softening of the brain, abscesses and tumors of the cerebellum, nervous affections; also in mental grief and shocks, after blows on the epigastrium, in dyspepsia, liver disease, temporary cold, uterine disorders and in certain hereditary conditions. But the Examiner should be thoroughly satisfied that it is a temporary condition before the applicant is accepted, and should examine the urine repeatedly before arriving at this conclusion.

DIABETES is differentiated by a general decline of health, a dry and harsh skin, great thirst, voracious appetite, accompanied by the voiding of large quantities of urine loaded with sugar. Again, in the absence of general symptoms, if, after repeated examinations, sugar always exists in the urine, the onset of diabetes may be imminent and the applicant should be declined.

QUALITATIVE TESTS.—*Specific Gravity.*—This usually exceeds 1.030, and if, in addition, a large quantity of urine is voided daily, diabetes may be suspected.

TROMMER'S TEST.—In all tests, boil, filter and remove the albumen, which negatives the test. Take a test-tube and put in it a drachm or two of urine; add liquor potassæ in excess, then slowly add a few drops of a solution of the sulphate of copper, which forms a bluish-white precipitate, the shaking of which produces a characteristic blue fluid. When this precipitate ceases to dissolve, neither reagent can be in excess, and heat may be applied. Next boil, and when sugar is present a red or orange deposit of the suboxide of copper will be precipitated. Where the copper solution is added first in excess, some of the blue hydrated oxide of copper may remain unchanged; and if too much liquor potassæ is used, it may blacken the sugar.

Caution.—"Saccharose," or cane sugar, as when ordinary sugar, or molasses, is put in urine to puzzle the novice, gives a black precipitate with Trommer's test.

A Better Test.—The presence of animal sugar forms this red precipitate, but many other organic substances have the same effect. Tartaric acid is one of the substances possessing this property, and yet does not reduce the copper by boiling; it is therefore used in the following test:

FEHLING'S TEST.—Make the test fluid fresh as follows: Sulphate of copper, five grains; neutral tartrate of potash, ten grains; liquor potassæ, two drachms. Mix these ingredients, and an intensely blue, clear fluid will be formed. Put a small quantity of this in the test tube and boil; while at the boiling point add the suspected urine, drop by drop, until equal in quantity to the test fluid; if sugar be present in quantity, it will form a precipitate of a red or orange color. The copper and alkaline fluids should be kept in separate bottles until about to be used, so as to have the test fluid fresh.

Small quantities of sugar, such as less than three parts in 1000, present various anomalies. In such cases the uric acid and coloring matters of the urine have a reducing power, and therefore the copper precipitate is never red, but yellow, or in fact any intermediate shade, from the deep blue of the test fluid, through green to yellow. Again, if the urine is highly phosphatic, boiling with the alkaline solution may throw down the phosphates, forming with the copper deposit, reduced by the normal urinary ingredients at the same time, a precipitate resembling the deposit of copper produced

by sugar. In that case we must decolorize the urine by passing it repeatedly through a filter of animal charcoal. Also we must in all cases remove the albumin by boiling and filtration.

THE BISMUTH, OR BOETTGER'S TEST, may be used to confirm either of the foregoing tests, as follows: Take about a drachm of urine, freed from albumen, in a test-tube, and add an equal amount of liquor potassæ, and then about two grains of the subnitrate of bismuth. Boil for a minute or two, and if sugar is present, the bismuth will be changed to some color between black and gray, according respectively to the large or small amount of sugar in the urine.

QUANTITATIVE TESTS, such as Fehling's volumetric method, and estimation by the polariscope, may be found described in books on this subject.

DR. WILLIAM ROBERTS' FERMENTATIVE TEST is generally used by Insurance Examiners to determine the number of grains of sugar present in an ounce of diabetic urine, as follows: "(1.) Four ounces of urine are placed in a twelve-ounce vial, or special tube manufactured for this purpose, with a lump of German yeast of the size of a walnut. (2.) The vial is then loosely corked, or covered with a glass slide, and placed in a warm place to ferment. (3.) A companion vial filled with the same urine, say a three-ounce vial, is tightly corked and placed beside the fermenting vial. (4.) In about twenty-two hours, when fermentation has ceased, the two vials are removed to a cooler place. (5.) Two hours after—or twenty-four hours from the beginning of the experiment—the contents of the vials are separately poured into two cylindrical glasses, and the density of each is estimated. (6.) The difference in specific gravity of the two is thus ascertained, and every degree of density lost indicates one grain of sugar per fluid ounce of the urine examined."

PHYSIOLOGICAL.—Prof. Witthaus, in his "Manual of Chemistry," briefly sums up the metabolism of sugar as follows:

"The greater part of the glucose in the economy in health is introduced with the food, either in its own form or as other carbohydrates, which by digestion are converted into glucose; a certain quantity is also produced in the liver at the expense of glycogen—a formation which continues for some time after death. In some forms of diabetes the production of glucose in the liver is undoubtedly greatly increased. The quantity of sugar normally existing in the blood varies from 0.81 to 1.231 parts per thousand; in diabetes it rises as high as 5.8 parts per thousand.

"Under normal conditions, and with food not rich in starch and saccharine materials, the quantity of sugar eliminated as such is exceedingly small—so small, indeed, that some observers have contested the fact of any being eliminated in health. It is oxidized in the body, and the ultimate products of such oxidation are eliminated as carbonic acid and water. Whether or not intermediate products are formed, is still uncertain; the probability being that they are. The oxidation of sugar is impeded in diabetes. Where

this oxidation, or any of its steps, occurs, is at present a matter of mere conjecture; if, as is usually believed, glucose disappears to a marked extent in the passage of the blood through the lungs, the fact is a strong support of the view that its transformation into carbonic acid and water does not occur as a simple oxidation, since the notion that sugar or any other substance is 'burned' in the lungs, beyond the small amount required for their nutrition, is scarcely tenable at the present day.

"So long as the quantity of glucose in the blood remains at or below the normal percentage, it is not eliminated in the urine in quantities appreciable by the common tests; when, however, the amount of glucose in the blood surpasses this limit from any cause, the urine becomes saccharine, to an extent proportionate with the increase of glucose in the circulating fluids. The causes which may bring about such an increase are numerous and varied; many of them are entirely consistent with health, and the mere presence of increased quantities of sugar in the urine is no proof, taken by itself, of the existence of diabetes.

"In true diabetes the elimination of sugar by the urine is constant, unless arrested by regulation of the diet, and not temporary, as in many other conditions. The quantity of urine is increased, sometimes enormously, and the specific gravity is high; the elimination of urea is increased absolutely. The quantity of sugar eliminated varies from 6.4 ounces to 12, and even 45, ounces in twenty-four hours. During the night less sugar is voided than during the day; the hourly elimination increases after meals, reaching its maximum in four hours, in proportion to the amount of food taken. It, is, therefore, obvious that, in order to make quantitative estimates of sugar of any clinical value, it is necessary to take the sample from the mixed urine of the whole twenty-four hours."

BILE.

Bile in the urine is generally due to liver disorders or obstruction of the biliary ducts, and jaundice usually coexists. The urine is greenish in color, usually acid, with a variable specific gravity, and often contains albumin.

PETTENKOFFER'S TEST FOR BILE.—Boil to precipitate the albumin; when cool, decant into a clean tube and filter. Then place the tube into clean water, drop a piece of white sugar into the urine, and add slowly by drops two-thirds of its bulk of sulphuric acid; in from fifteen minutes to an hour a reddish-brown color is produced.

HELLER'S TEST.—Add a little white of egg or albumin; coagulate with nitric acid, and a play of colors forms from yellow to reddish brown.

BLOOD.

Bloody urine is brown or red in color. Its reaction and specific gravity are variable.

HEAT TEST.—Boiling coagulates the albumin of the blood and entraps the blood discs, which form a dirty coagulum.

SULPHURIC ACID changes the color of the urine to a reddish-brown, revealing the presence of hæmatin. The appearance of blood corpuscles under the microscope confirms the diagnosis. When blood appears in the urine it precludes insurance, and the cause must be ascertained. It may ensue from injuries, calculi, pyelitis, Bright's disease, tumors of the bladder, cystitis, hyperæmia of kidney, nephritis; also in purpura, scarlet and typhus fevers, malaria, cholera, etc.

CHYLE.

Chyle in the urine shows a white color; reaction and specific gravity variable. It is a disease of the Tropics, the urine often resembling jelly, containing fat and albumen.

TEST.—Pour into the test-tube half an inch of sulphuric ether to separate the fat, add the urine; take out some of it with a pipette and put on a watch-glass; evaporate by heat and the stain of fat remains.

MUCUS.

Mucus in some quantity always exists in the urine. It may be precipitated with acetic acid. When iodine is added to the acidulated urine, the mucin is colored and the epithelial cells are rendered distinct. Irritation of the urinary tract causes an increase of mucus; inflammation is indicated by pus in the urine.

PUS.

Pus produces a milky appearance of the urine and causes a dense white sediment. The urine quickly becomes alkaline, and contains albumin in proportion to the amount of pus present. Acid urine containing pus, when freshly voided, indicates that the pus came from the kidneys. When alkaline, it is inferred that the pus originates in the bladder. It may accompany gonorrhœa, gleet, leucorrhœa or mucous abscesses. Pyuria of a cystic or renal origin is of more moment.

TEST.—Allow the urine to settle; pour off the supernatant fluid and add liquor potassæ. The pus is changed into a viscid gelatinous mass, adhering to the tube. Pus corpuscles are seen under the microscope.

UREA.

Urea constitutes seventy or eighty per cent of the nitrogenous constituents of the urine and represents the ash of those substances which have been burned up in the animal economy. The estimated amount of urea excreted by a healthy man is 512.4 grains per diem, the quantity fluctuating with the amount of nitrogenous food consumed and the rate of tissue transformation. Excessive muscular exercise increases it, but when the kidneys reach their limit of excretory power, it passes off in diarrhœa through the bowels.

A diet of fat and farinaceous food, in addition to nitrogenous principles, lessens the amount of urea and the destruction of tissue. Excess of drinking water increases it, especially when taken during meals; table and other salts have the same effect. Moderate warmth diminishes it, fever increases it.

Clinical Significance.—In the urine it exists in the proportion of 15 to 20 parts in 1000; in the blood, .016 parts in 1000.

Excessive Excretion of Urea.—When the amount exceeds two per cent it indicates fever, or that the person drinks too little water to dissolve and eliminate the nitrogenous proximate principles of the body, or that he has been perspiring profusely. Azoturia is the name applied to this condition. In some cases it is accompanied by a corresponding increase in the excretion of water; in others both the relative and absolute quantity is greater, and crystals of the nitrate of urea appear upon the addition of nitric acid. This increase may occur temporarily without causing symptoms; but when it persists, it is usually followed by derangement of the stomach and bowels, nervous disorders, acidity, flatulency, languor, restlessness and a frequent desire to urinate. There is azoturia in diabetes, and some suppose it to be the first stage of that disease. The specific gravity will be about 1.030 or more.

Diminished Excretion of Urea is of much graver import and may merge into uræmia. It may be caused by extreme emotion, excessive drinking, exposure to chill. It is diminished in Bright's disease with contracted kidney, in some chronic organic affections, and often preceding the paroxysms of rheumatism, gout and asthma.

TESTS FOR UREA.—A rough test is furnished by the readiness with which crystals of the nitrate of urea form after adding nitric acid. These crystals do not form readily unless there is an excess of urea. Add to the urine one-fourth its bulk of nitric acid in a test-tube immersed in cold water, and the relative proportion of crystallized nitrates is easily calulated.

Quantitative Test.—Use the hypobromite solution recommended by Russel and West. This solution is made by dissolving 100 parts of caustic soda in 250 parts of water, and adding when cold 25 parts of bromine. Keep the bromine separate until the test is made, as the solution must be fresh.

The test depends on the fact that urea mixed with alkaline hypobromites is decomposed and yields nitrogen, from the amount of which gas the quantity of urea is estimated. The necessary apparatus consists of a tube in which the urine is placed (four or five times as much of the solution being added), and a pneumatic trough with a measuring tube graduated to show the amount of nitrogen gas.

PHOSPHATES.

Two kinds of phosphates are found in the urine—phosphate of lime and ammonio-magnesian, or triple phosphates. About six parts in 1000 of

normal urine consists of phosphates; when they are in excess, the urine is generally of a light color. These salts are derived from the food and tissues, and are united with the organic, nitrogenized, proximate principles. Their quantity in the urine depends on the food eaten and the drain on the nervous system from study or sexual excesses.

Clinical Import.—When excreted in excess, there is danger of phosphatic calculus. Disease changes its proportions. Increased elimination occurs in inflammatory diseases of the nervous system, acute mania, delirium tremens, paralysis, diseases of the bones, and rickets. It is generally diminished in Bright's disease, gout, rheumatism and pneumonia.

TESTS.—Heat gives a cloudy precipitate, which nitric acid dissolves. The phosphates are deposited when the urine becomes alkaline and ferments. Under the microscope, phosphate of lime is amorphous. The triple phosphates occur in rhombic prisms, which readily dissolve in acetic acid, while oxalate of lime crystals do not.

Quantitative.—A rough estimation is made by making some urine alkaline with ammonia and adding an ammonio-magnesian solution to it. If the amount already in the urine is normal, a precipitate at once occurs; if the normal amount is lacking, this precipitate is delayed.

COMPOSITION OF URINE.

Water, about 940 parts in 1000; urea, about 30 parts in 1000; salts, about 6 to 10 parts in 1000; uric acid, about 1 part in 1000; extractives, about 23 to 26 parts in 1000.

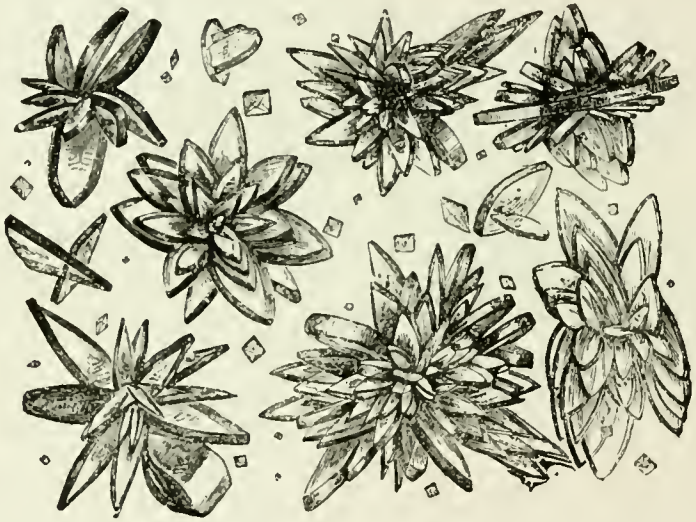
CHEMICAL EXAMINATION OF URINE.

INGREDIENTS.	TESTS.					
	Color.	Reaction.	Specific Gravity.	Heat.	Nitric Acid.	Other Tests.
Ammonium Carbonate	Varies.	Alk'line	Varies.	.....	Effervescence.	.....
Excess of urea	Varies.	Varies.	High.	.....	Nitrate crystals	Crystals, with oxalic acid.
Phosphates	Varies.	Varies	Varies.	White precip.	.....	Soluble in nitric acid.
Albumen	Varies.	Varies.	Varies.	White precip.	White precip.	Mercury bichloride or tannin causes a precipitate.
Sugar	Varies.	Varies.	High.	.....	.....	Trommer's or Fehling's test.
Bile	Brown.	Varies	Varies.	Prec. often wh.	Precip. colored.	Pettenkoffer's or Heller's test.
Blood	Brown.	Varies.	Varies.	Precip. dirty.	Precip. dark.	Microscopic and iron test.
Chyle	White.	Varies.	Varies.	Precip. white.	Precip. white.	Separation of fat by ether.

MICROSCOPICAL EXAMINATION OF URINE.

Hints.—Shake the urine thoroughly, add a little salicylic acid to prevent decomposition, pour into a conical vessel, cover, and allow it to settle for half a day or longer. When about to examine it, prepare a clean glass slide, and upon this place a few drops of the urinary deposit by means of a pipette; cover the drops with a thin glass disc, and examine with a one-quarter or one-fifth inch objective lens.

Search for the different crystals, amorphous urates and phosphates, epithelial cells, fat globules, mucus, pus and blood discs; and watch with extra care for tube casts, examining many specimens from the same deposit before any conclusion is reached, especially if the urine contains albumen, as these abnormal ingredients generally coexist.



Group of crystals of uric acid, often termed cayenne pepper grains, with octahedra of oxalate of lime. × 215. (After Beale.)

Five classes of minute bodies are usually met with in sediment deposited from urine. These are: First, crystals; second, casts; third, mucus, blood and pus corpuscles; fourth, fungi, or minute vegetable organisms; fifth, accidental extraneous matters.

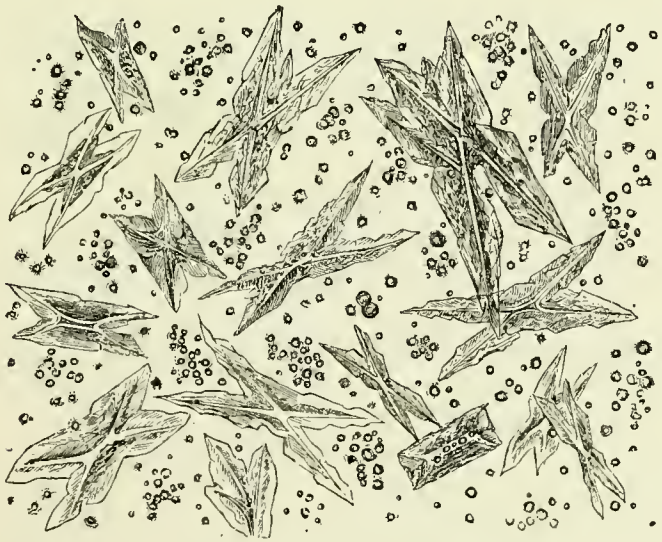
CRYSTALS.—Normal urine should never contain a sediment. Appearance of crystals within twenty-four hours after the urine has been passed, may be accepted as indicating a non-healthy condition of the system, whether temporary or permanent. The crystals most frequently met with are, uric acid, ammonia, oxalate of lime and an amorphous deposit of the urates.

1. URIC ACID.—This is the product of a metamorphosis of tissue. A characteristic test for it is effected by the addition of a few drops of nitric acid to the suspected deposit, which has previously been placed in a capsule,

the mixture is then to be strongly agitated; a drop of ammonia is added, which instantly produces a rich purple tint. But both uric acid and the urates can be more easily and quickly determined by the microscope.

Crystals of uric acid, notwithstanding that they vary in size and form, are very readily distinguished. To obtain them rapidly, a portion of the suspected deposit is dissolved in a drop of liquor potassæ, and this alkaline solution is then treated with acetic acid, and in the lapse of a few hours the crystals of uric acid will be formed.

When we find the amount of acid diminished in the urine, we suspect the more advanced stages of Bright's disease, but an increase should lead



Beautiful crystals of triple or ammonio-magnesian phosphate and spherules of urate of soda. × 215. (After Beale.)

us to suspect a rheumatic diathesis, a tendency to acute inflammation, gastric or hepatic disorders or intemperance.

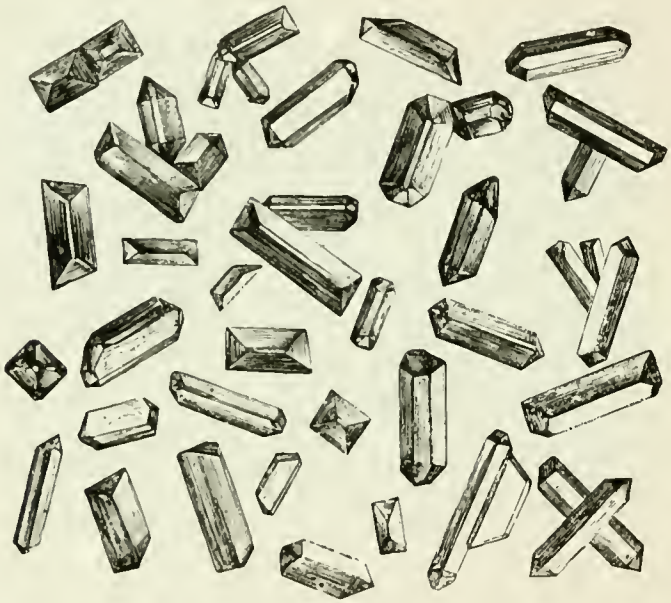
URATES.—The pathological conditions in which the urates are found, are much the same as those in which uric acid occurs.

The urates consist principally of urate of soda and of ammonia, and of small quantities of urate of lime and magnesia, and the deposits formed on their precipitation are usually pink, brown or white. They are dissolved with great readiness on heating the urine. Acids decompose them. Under the microscope, the urates are seen to be either irregular amorphous particles, round globules or needle-like crystals. Urate of soda is shown in the shape of round globules of various size, from some of which fine needles project. Urates of soda and of ammonia are usually globules

and crystals, while the irregular particles are supposed to represent urates of lime and soda.

Urine containing a sediment of urates is usually very acid, or not infrequently becomes so. In urine which has become cold, these deposits are thrown down much more abundantly than in that which is freshly passed.

TRIPLE PHOSPHATES.—These are generally beautiful microscopic objects, but their appearance varies greatly with the rapidity of their crystallization. Their color is produced by a combination of phosphoric acid with soda, lime and magnesia; and they are derived in part from food and in part from changes in albuminous substances—specially of the nervous structures.



Crystals of triple phosphates. $_2MgONH_4O\ PO_5 + 12aq$. In the form of triangular prisms, with obliquely truncated extremities, as they frequently occur in urine. In many cases the crystals are four-sided. Not unfrequently the shaft of the crystal is so short that the two triangular extremities are seen quite close together, and the crystal, without care, might be mistaken for an octahedron. × 45. (After Beale.)

$\frac{1}{11\,6}$ of an inch — |_____| × 45.

$\frac{1}{100\,6}$ " |___| × 215.

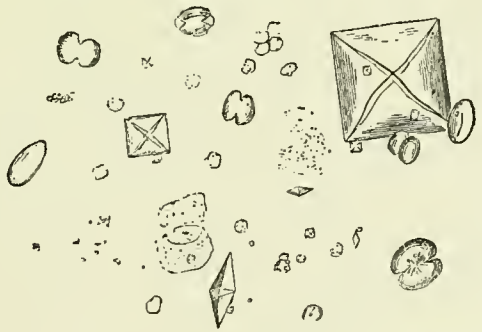
These are kept in solution by the acidity of the urine, but as soon as this becomes alkaline, they become precipitated. They are often met with in heavy deposits containing purulent urine, resulting from chronic catarrh of the bladder, or in cases of temporary or permanent paralysis; and they are found also in many affections in which the vital powers have become seriously lowered and the acidity of the urine diminished.

Applicants laboring under great general debility and indigestion, associated with an impaired tone of the nervous system, usually present

this symptom, and it is very common in men depressed by mental toil or anxiety.

This is also found when an excess of animal food is taken into the system during very active exercises, and in the rheumatic diathesis. It is increased in all inflammatory diseases of the nervous system, in paralysis, in severe nerve lesion, in acute mania; and is diminished in Bright's disease and gout, in rheumatism and in most febrile and inflammatory affections.

OXALATE OF LIME.—The presence of crystals of this sort is noted in morbid conditions, and is generally found in persons who are weighed down by excessive anxiety, or who have given way to excessive indulgence or masturbation. Dyspeptic persons, or those who suffer from uneasiness after meals, or those troubled with frequent seminal emissions and irritation of the bladder, are apt to pass these crystals in quantity. These applicants are usually either very irritable or very dejected; frequently they complain of



Dumb-bell and octahedral crystals of oxalate of lime. One very large octahedron is seen at the right hand side of the figure. × 215. (After Beale.)

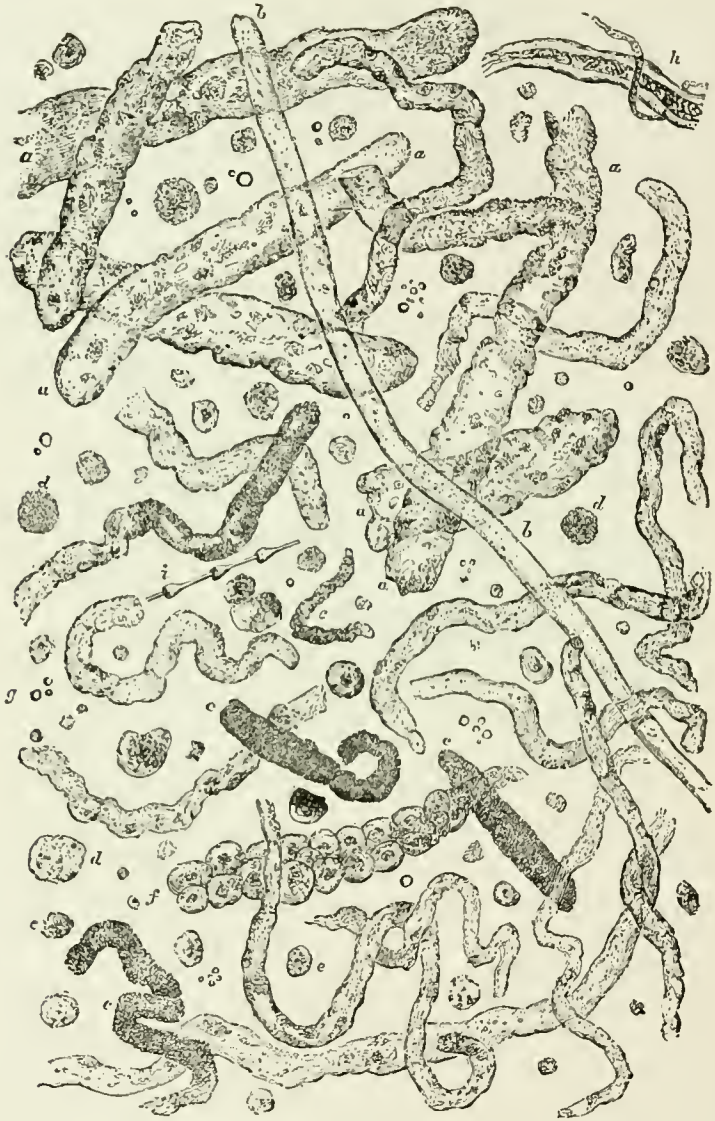
loss of memory and of dull pain across the loins; they are very liable to boils and carbuncles, apt to be emaciated, and are generally out of health.

The urine containing this crystal is usually of high specific gravity, and shows an increase of urea, and ordinarily contains a cloudy deposit.

Persons in this condition are usually said to have oxaluria, although its existence as a separate affection has been denied.

Oxalate of lime may also be detected in the urine of persons after eating rhubarb plant; and may be also found in the urine of persons recovering from severe acute maladies, but it is only found in very small quantities in the urine of healthy persons, so that the presence of a few crystals cannot be looked upon as of the least practical importance. Under the microscope, it appears in well-defined octahedra, varying in size, and also dumb-bell shaped, the former being more common.

CASTS.—These bodies are minute tubular masses of coagulated matter, which form in diseased renal tubules and are washed down into the bladder and voided in the urine. Their size corresponds to that of the tubes in



a, casts of large diameter, containing granular matter scattered through them unequally. *b*, a very long, clear and perfectly transparent cast, containing only a few minute oil globules here and there. *c*, dark granular casts, some of them containing a few oil globules. *d*, large masses of granular matter, many of them appearing like granular cells. Most of these are derived from the mucous membrane covering the glans. *e*, cells of renal epithelium, darker and more granular than usual. *f*, mass of squamous epithelium, probably from one of the follicles of the mucous membrane of the bladder. *g*, free oil globules. *h*, portions of cotton fibre. *i*, portion of feather. x 215. $\frac{1}{1000}$ of an inch —— x 215. (After Beale.)

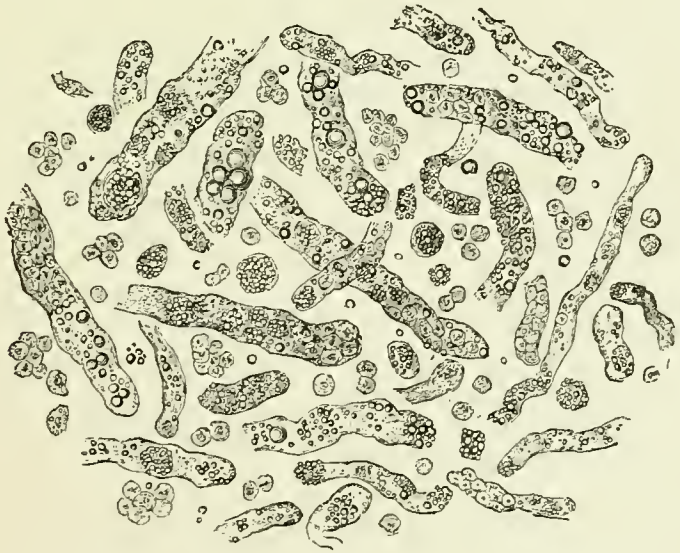
which they are formed, and they differ in character according to the type and stage of the disease in which they occur.

Varieties.—They are named exudative or fibrinous, desquamative or epithelial, fatty, granular, and hyaline or waxy.

EXUDATIVE OR FIBRINOUS CASTS are masses of coagulated matter from the uriniferous tubules of the kidney, to which epithelial cells may or may not adhere.

They are more commonly found during the first stage of the inflammatory form of Bright's disease.

DESQUAMATIVE OR EPITHELIAL CASTS are detached pieces of the lining membrane of those tubules, the cells being opaque, like unhealthy epithelium.



Casts containing oil from the urine of a case of fatty degeneration of the kidney of long standing. Many cells of epithelium contain no oil. × 215. (After Beale.)

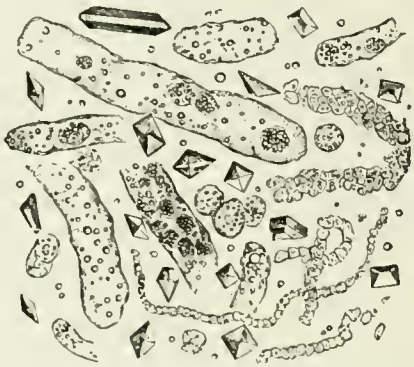
FATTY CASTS are those plugs of coagulated matter whose walls are covered with minute globules of oil from fatty degeneration.

GRANULAR CASTS are seen when the process of fatty degeneration goes on until the oil globules appear subdivided and present a granular aspect.

The fatty and granular casts are common to the second and third stages of inflammatory Bright's disease, and indicate the large white granular kidney.

HYALINE OR WAXY CASTS are extremely transparent in appearance, showing only the outlines, and contain no fat, epithelium or granules. They are produced by the exudation of fibrin through the walls of the diseased vessels into the uriniferous tubules. They may be absent for a few days and then reappear. They are found in the stage of atrophy of all

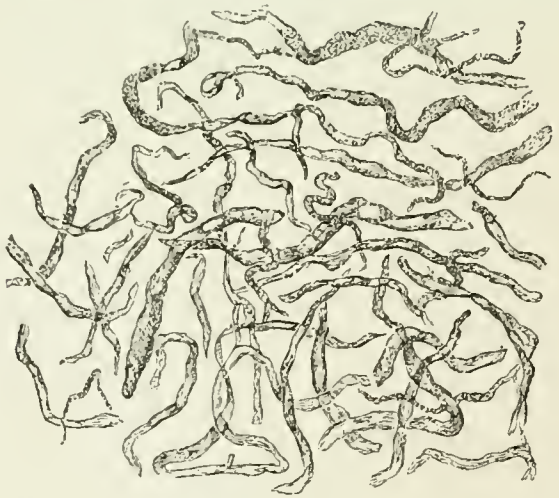
forms of Bright's disease of the kidney, and do not, as at first might appear, solely indicate waxy kidney. Blood corpuscles and crystals may appear on the surface of or imbedded in casts.



Crystals of triple phosphate; the prismatic portion of which is defective, and casts containing oil from the urine of a patient suffering from chronic nephritis, with partial fatty degeneration. (After Beale)

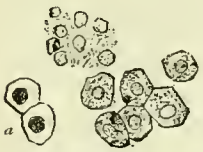
EPITHELIAL CELLS of the different varieties may be found in the field of the microscope, and are classified as follows:

Vaginal Epithelium.
Normal Renal Epithelium.
Atrophied Renal Epithelium.
Bladder Epithelium.
Epithelium from the Pelvis of Kidney.



Long, narrow threads of viscid mucus; with spermatozoa in casts of the seminal tubules. ×215. (Beale.)

When renal epithelium, blood discs and tubular casts are found together, either acute inflammation or intense congestion of the kidneys may be inferred.



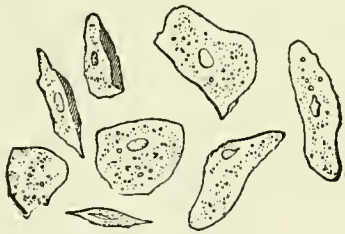
Epithelium from the convoluted portion of the uriniferous tube. *a*, treated with acetic acid. × 215.

Epithelium from the pelvis of the human kidney. × 215.

Epithelium from the ureter. × 215.

Epithelium from the urethra. × 215.

Bladder epithelium *a*, from the general surface. *b*, from the fundus *c*, scaly epithelium from the bladder. × 215.



Vaginal epithelium from the urine. × 215.

Epithelium from the bladder, showing the hollows in some of the large cells into which the subjacent columnar cells fit.

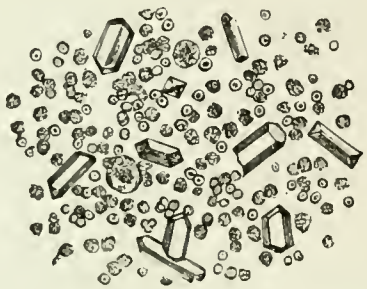
Epithelium from the vagina.

Young epithelial cell from the bladder, undergoing division. × 700.

Formation of pus from terminal matter of epithelial cells. × 215.

$\frac{1}{1000}$ of an inch ⌊——⌋ × 215.
" " ⌊————————⌋ × 700. (After Beale.)

BLOOD IN THE URINE, if considerable in amount, gives it a reddish or smoky appearance. When it originates from the kidneys, it is diffused throughout the urine; when from the bladder or urethra, blood clots are usually found. The blood corpuscles are distinguished from other cells in the

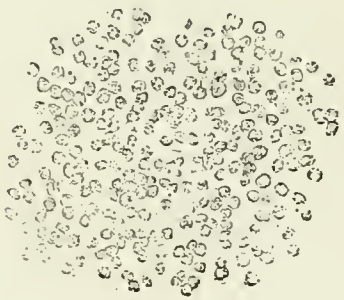


Pus and blood corpuscles, with crystals of triple phosphate, multiplied 215 times. (After Beale.)

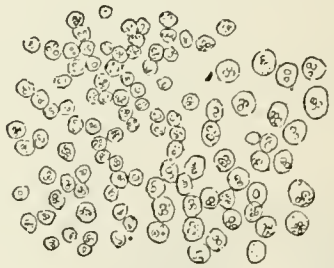
urine by their lack of nuclei and slight refractive power. The clinical purport of this condition depends upon its source. It may ensue from lesions of the kidneys, or bladder, or urethra—such as traumatism, nephritis, renal hyperæmia, pyelitis, calculi, cystitis, etc., or from constitutional diseases, as cholera, scarlet fever, purpura, etc.

PUS IN THE URINE imparts a milky appearance. When the voided urine is acid, the origin of the pus is inferentially in the kidneys; if alkaline, in the bladder.

Pus is distinguished from other cells by their larger size, granular appearance, and the fact that acetic acid makes their nuclei very distinct; and if the same acid is added in excess, the cell wall and contents disappear. It is difficult to infer its source.



Pus corpuscles from urine. × 215. (Beale.)



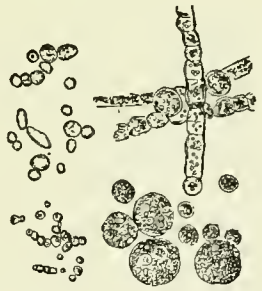
Pus corpuscles which have been acted upon by acetic acid. × 215. × 403. (Beale.)

SPERMATOZOA IN THE URINE impart a mucous deposit, if in sufficient quantity, and consist of minute bodies, $\frac{1}{700}$ of an inch long, with an oval

head and caudal extremity. They are seen in the urine after sexual intercourse, seminal emissions, etc., and have a trivial clinical import in most cases.

FUNGI.—The vegetable organisms most often observed in the urine are torula cervisiæ found in diabetes; penicilium glaucum, found in acid albuminous urine; and sarcinæ, whose origin is obscure.

EXTRANEOUS MATTERS most common are fibres of cotton, wool or linen and the dust of sweepings.



The sugar fungus from diabetic urine. × 240. (Beale.)

MICROSCOPIC EXAMINATION OF URINARY DEPOSITS.

INGREDIENTS.	TESTS.				
	Color.	Heat.	Hydrochloric Acid.	Nitric Acid.	Other Tests.
Nitrate of ammonia..	White or pink.	Soluble.	Soluble.	Soluble.	Precipitates when cool.
Phosphates	White.	Insoluble.	Soluble.	Soluble.	Gelatinous precipitate when ammonia is added.
Oxalate of lime.....	White.	Insoluble.	Soluble.	Soluble.	Granular precipitate when ammonia is added.
Uric acid.....	Red.	Insoluble.	Insoluble.	Soluble.	Deposit on a watch glass, add two drops of nitric acid, evaporate, and when cool add ammonia; it turns to a rich purple color; called the murexide test. Shake, and deposit will mix.
Mucus	Cloudy.	Insoluble.	Insoluble.	Insoluble.	Deposit will not mix by shaking.
Blood.....	Red.	Insoluble.	Insoluble.	Insoluble.	Discs under microscope.
Pus.....	Yellow.	Insoluble.	Insoluble.	Insoluble.	Microscopic appearances.
Cystine.....	White.	Insoluble.	Insoluble.	Insoluble.	Deposits hexagonal plates when cool.

PART III.

DISEASES RELATING TO LIFE INSURANCE.

HEREDITARY INFLUENCES.

Transmission of Disease.

A TENDENCY to certain diseases may be transmitted from generation to generation, which the Examiner must be able to detect by making comparisons between the family record, previous history and present physical condition of the applicant.

Collateral Physiological Conditions.

1. The relative ages of parents at the time of the applicant's birth should be considered a factor in the estimation of his future expectation of life. Great disparity of age militates against the offspring, even though other considerations are favorable. In order to beget vigorous children, the sexes ought to be of about the same age and in the prime of life. In case of marked disparity of age, the progeny is apt to inherit general debility or some particular disease from the weaker parent.

2. Consanguinity, or a too close blood relationship between father and mother, deteriorates the power of resisting disease in their issue. The unwritten law of life insurance should forbid marriage of cousins of the first degree, and place no bar against the descendants of the man who marries his deceased wife's sister.

3. The hereditary tendency to disease may have been outgrown, or not yet reached, according to the affinity existing between certain ages and certain diseases, as pointed out in the section on age. This inherited taint often remains latent for many years, or several generations, only to reappear when certain exciting causes enliven the dormant germs of disease. The family inclination to disease is more manifest among brothers and sisters than between parents and children.

4. Sameness of physical organization between father and mother, and likeness in the conditions under which they were reared, conspire to produce inferior progeny.

5. Intermarriage of different races is physiologically beneficial, unless it necessitates an extreme change of climate or manner of living. As a rule,

the vigorous children of healthy English parents, born in tropical regions, pine away unless removed to a temperate zone.

6. Longevity of ancestors. The observation should extend over three generations. Longevity of both grandparents is most desirable, but the old age of grandparents on the maternal side is more apt to be reproduced in the grandchildren than that of the paternal side. Causes of death in the case of grandparents are essential, and any existing diathesis should, if possible, be traced back. At the same time, we must remember that the progress of civilization, hygiene and medical science has remarkably increased the average of human life, and still tends in the same direction.

7. Direct and indirect heredity. The direct implies the transmission of a specific taint from one generation to another. Indirect heredity means the production of constitutional peculiarities, not allied to organic disease, but due to impressions made through the mother during gestation which influence the subsequent development of the child. This is called the law of atavism, when certain qualities are traced back several generations. The intelligent use of this law has resulted in greatly improving domestic animals, and might be applied with equal benefit to mankind if stirpiculture were possible in organized society.

TRANSMISSION OF CONSUMPTION OR TUBERCLE.

The following are some of the theories, aside from the germ theory, which have been advanced by various authors with reference to this most prevalent constitutional taint. Discussion is purposely omitted :

1. Predisposition to it is more frequently inherited than acquired.
2. Maternal transmission is more virulent than the paternal.
3. Two consumptive parents intensify the tendency.
4. To transmit the taint, either one or both of the parents must be infected with the disease previous to gestation Nevertheless, as an exception to this rule, the second generation often escapes and the third inherits the taint from the first generation—grandchildren from grandparents.
5. The adverse environment of the individual often starts up a fatal attack, after almost a lifetime of immunity from symptoms of inherited tendency.
6. Any wasting disease in the parents, especially if in advanced life, may superinduce this fatal malady in their children.
7. The first-born children are not as susceptible as those born after the prime of life, when the disease becomes developed in either or both of the parents.
8. Inherited consumption usually appears before the third decade of life is completed ; the acquired form develops later in life.
9. Hard labor and exposures hasten its development.
10. The most robust physiques do not escape this latent tendency.

11. Consumption as a cause of death in the family record should be perseveringly sought out by the Examiner.

12. Among children, tubercle generally attacks the brain or abdominal organs before it appears in the lungs. Tuberculosis should, therefore, be suspected as the cause of death, in lesions of the brain or abdominal organs, among the deceased brothers and sisters of the applicant.

13. The relative virulency of the consumptive dyscrasia is best measured by its effects upon the applicant's immediate family.

14. Liability to the disease, when inherited from the father manifests itself most actively from the tenth to the thirtieth year. From forty-five to sixty-five the danger is slight.

15. Liability from the mother is greater than from the father, the disease being of a more virulent type, but the period of susceptibility is shorter, say between the ages of fifteen and thirty, with few deaths after forty.

16. When two deaths in a numerous family have occurred, the one a parent beyond forty and the other a brother or sister below the applicant's present age, if the examination presents no other objection, the risk is fair.

17. The single death of brother or sister, when other points of family history and personal examination are favorable, should not prevent insurance.

18. Two deaths of brothers or sisters older than the candidate, unless the individual condition and environment are most desirable, should reject.

19. The death of both parents, even at an earlier age than the present age of the applicant, should reject.

20. Three or more deaths in the immediate family, comprising a parent and two or more brothers or sisters older than the applicant, even though personal points favor, should reject.

21. When the applicant exhibits the tuberculous diathesis, although the family record shows no death from consumption, it should reject.

22. When the infant mortality in the family has been great, and the surviving members, including the applicant, are quite young, or he is the only surviving member, the risk is hazardous.

23. The death of a grandparent and parent in the same line proves that the taint exists in the applicant, and might be developed by any exciting cause, and renders the risk hazardous.

24. When the applicant resembles the tainted parent, though disease is more transmissible through the mother, the risk is hazardous.

25. When both parents have died comparatively young, the one from phthisis, and the other from cancer, abscess, erysipelas, intemperance, heart, kidney or brain disease, the applicant inherits the taint of one or both parents, and should be deemed a hazardous risk.

26. Deaths in the immediate family should make the Examiner suspect tuberculosis as a cause of death among more distant relatives, such as uncles, aunts, grandparents, etc.

27. Policies for limited periods may be issued in the case of some risks classed hazardous, when approved by the executive officers of the home office after receiving full information from the Medical Examiner.

28. Transmission of the scrofulous diathesis, which is akin to tubercle, as an expression of deficient and defective nutrition, must be detected and taken into account by the Examiner.

TRANSMISSION OF CANCER.

1. Cancer is a specific disease, and in regard to the frequency of transmission stands next to consumption.

2. Cancer and tubercle may coexist, but cancer usually excludes the latter.

3. The development of cancer generally occurs between thirty-five and fifty, when the vital forces begin to wane.

4. Females are more liable than males, and the parts most frequently affected are the generative organs and breasts.

5. When both taints, the cancerous and tubercular, exist in his family, the applicant should be rejected.

6. When two or more deaths from cancer have occurred in the applicant's family, he should be rejected.

7. The death of one parent should not necessarily reject.

8. Sporadic cases of cancer, though rare, may be encountered.

TRANSMISSION OF GOUT.

1. Hereditary tendencies can be traced in more than one-half of the cases.

2. When the gouty diathesis manifests itself before the age of thirty-five, the risk is hazardous.

3. Where both parents, or a parent and grandparent, and an uncle or aunt, have had gout, the risk is hazardous.

4. When one parent or a grandparent has suffered from gout, the applicant himself having never had an attack, and being of good habits, if the physical examination proves satisfactory, he should be eligible for insurance.

5. If the applicant has passed the age of thirty-five without showing any symptoms of the disease, and his physical examination is unobjectionable, even though two ancestors exhibit a history of gout, he is eligible for insurance.

6. The inherited diathesis is not always manifested by a typical attack of gout, but by degenerations in the heart, blood vessels, kidneys and nervous system.

TRANSMISSION OF RHEUMATISM.

1. About one-third of the cases reveal transmission.

2. The liability to it is most marked between fifteen and thirty; after fifty it is slight.

3. Acute articular rheumatism, or the unmistakable rheumatic diathesis, is referred to here, and not other and minor forms of rheumatism.

4. If the rheumatic attacks are recurrent and metastatic, the applicant should be rejected.

5. One or more attacks, coupled with a family history of acute articular rheumatism, renders the risk hazardous.

6. If no attacks appear before thirty-five, and the applicant is acceptable in other respects, he is eligible for insurance.

TRANSMISSION OF SYPHILIS.

1. Syphilis may be inherited from father or mother, and causes great infant mortality.

2. The force of the transmitted disease spends itself with advancing years under favorable environment and treatment, so that an applicant who presents no present traces of the disease, if unobjectionable in other respects, is eligible for insurance.

3. The hereditary form is less objectionable than the acquired form, but any candidate presenting decided marks of this disease, thus proving that radical curative treatment has been neglected, is a hazardous risk.

4. The acquired form is more disastrous; and any candidate presenting symptoms of secondary or tertiary syphilis at the examination, should be rejected.

5. Syphilis of either variety is capable of complete cure, and the candidate who has undergone the requisite treatment for two years, and has shown no relapse in subsequent years, is eligible for insurance.

6. Some of the objective symptoms of syphilis are as follows: Skin eruptions; enlarged lymphatic glands in the neck and groin; alopecia; scars on skin or patches in the mouth and throat; onychia; periosteal nodes on the bones, especially of the shin; rheumatic pains in the bones and joints, worse at night, etc.

TRANSMISSION OF NERVOUS DISEASES.

INSANITY.

1. Cerebral diseases, such as apoplexy, paralysis, epilepsy and insanity, are often inherited.

2. Hereditary insanity presenting itself in the family record or person of the candidate, other things being equal and favorable, lessens the expectation of life about one-fifth, and should render the risk hazardous.

3. The indirect risk of shortening life from insanity consists in its indication of central nervous diseases, and the greater liability to accidental death.

4. Incidental or temporary insanity may be differentiated, and should not always reject.

5. The same form of cerebral disease is not always transmitted, but epilepsy may follow insanity, or *vice versa*.

6. When the family record of cerebral diseases is poor, and the personal examination of the candidate is below par, he should be rejected.

7. The Examiner must be on the alert to detect cases of incipient or masked insanity.

8. Transmission occurs in one-third to one-half the cases of insanity.

9. The tendency to insanity may have been outgrown, or not yet arrived at, according to age and condition.

10. The children resembling the affected parent in physical conformation and appearance are more liable to the disease.

11. Baillarger's remarks on atavism are reliable.

(*a*.) Transmission of the mother's insanity is more serious than that of the father, because her disorder is more frequently hereditary and because she transmits it to a greater number of children.

(*b*.) Girls are more likely to inherit the mother's insanity; boys, the father's.

(*c*.) Transmission of the mother's insanity is scarcely more to be feared, as regards the boys, than that of the father.

(*d*.) The mother's insanity is twice as dangerous to the daughters.

12. The insanity of brothers and sisters establishes the family proclivity, more than that of parents.

13. The environment and personal habits of the applicant will lead the observant Examiner to suspect the appearance of inherited tendencies in the future. The occupation, domestic or civil troubles, intercurrent diseases, laborious pursuits, evil courses, intemperance, emotional excitements, etc., all tend to develop the family predisposition.

14. The dread of insanity, as Bucknill and Tuke remark, in many families of insane tendencies, is so great as to constitute, in itself, a morbid feeling sufficiently strong to mislead the observation, warp the judgment, and cause concealment and falsehood towards those who should command perfect confidence.

15. The melancholic temperament is prone to insanity, and the following symptoms are usually presented: The features are impassive and immobile and the expression is moody or sad; the complexion is rarely clear and healthy, the skin is sallow, hard and dry, or cool and clammy; the eyes are fixed, or staring, and the glance is askance, uneasy and suspicious; dyspepsia and constipation are complained of, and the urine is scanty and loaded with lithates; the pulse is not strong.

16. A more nervous temperament will present less obvious symptoms of insanity. There is more activity of manner and vivacity of features. They are loquacious, have flashing eyes; the skin is dry and pallid and florid by turns; there are derangements of secretions and digestion, and a tendency to emaciation.

17. Defective nutrition is held by many high authorities to be the chief factor in the etiology of insanity.

18. All diseases which impair the constitution and impoverish the blood tend to awaken the predisposition.

19. Still, the worst cases of insanity often enjoy vigorous health.

20. To form a correct opinion in some of these incipient cases will tax the highest powers of observation and judgment.

TRANSMISSION OF EPILEPSY.

1. *Definition.*—According to most recent authorities, an epileptic convulsion is the symptomatic expression of a complex derangement of the cerebral collection of nerve-centres, the location of the central disorder, and its nature being inferentially determined by the character of the motor and sensory phenomena.

2. Inherited transmission accounts for about thirty or forty per cent of cases of epilepsy.

3. The following diseases, in their order, in parents predispose to epilepsy in the offspring: Insanity, consumption, alcoholism, syphilis, cranial malformation, some neurosis.

4. The hereditary form of epilepsy usually begins before the twentieth year; in fact, at an early age.

5. Before the tenth year, in twenty-nine per cent of 1450 cases from all causes, epilepsy makes its appearance.

6. Between the tenth and twentieth years, over one-third of 1288 cases from all causes begin to develop.

7. According to age and sex, the result of 980 cases of general epilepsy is as follows:

DR. A. M. HAMILTON'S TABLE.

AGE.	Females.	Males.	Total.
Under 10.	103	95	198
Between 10 and 20.	171	97	268
Between 20 and 30.	145	92	237
Between 30 and 50.	81	136	217
Over 50.	11	49	60
Total.	511	469	980

8. Females under thirty are almost twice as liable as males.

9. Males over thirty are twice as liable as females.

10. The children of syphilitic parents develop epilepsy later in life than those whose parents suffered from alcoholism.

11. Among males, when epilepsy appears late in life, we almost always find syphilitic or other cerebral lesion.

12. Females affected with the disease at an advanced age generally present a history of migraine or menstrual derangement, and the convulsions are apt to partake of a hysteroid character.

13. Confirmed epilepsy should always reject the applicant, for two reasons; first, because there always exists physical and mental impairment of health, and, secondly, on account of the danger of accident during the convulsions.

14. Even after a long period of immunity from attacks, the danger of recurrence is omnipresent and the risk is hazardous.

HEREDITARY ALCOHOLISM.

Two forms are recognized.

FIRST FORM is the direct transmission of the disease or defect from parents to children.

1. This hereditary propensity is apt to show itself in early life, and may be intensified at the period of puberty and the menopause.

2. Instances are numerous in which the habit begins late in life; and again, when children are reared and educated away from their parents, under a favorable environment, and yet develop the propensity unerringly.

3. The hereditary tendency is not always manifested in a desire for drink.

4. It may consist in feebleness of nervous constitution; such victims may be moral imbeciles, with an insatiable craving for nervous stimulants of all kinds and constant excitements.

5. The general laws of heredity are illustrated in the transmission of alcoholism. The tendency may come down from father to son, or skip one or more generations, assuming in the intermediate periods some other form of nervous disorder.

THE SECOND FORM is indirect, and consists, not in the inheritance of the taste for alcohol, but in a morbid tendency to mental and nervous disorders of a different kind, such as epilepsy, hysteria, the various forms of insanity, every degree of arrested mental development, from feeble-mindedness to complete idiocy, etc. Such offspring are pale and puny and the victims of all morbid influences.

INHERITED TENDENCY TO APOPLEXY.

1. The tendency to arterial degenerations, periarteritis, organic diseases and consequent cerebral hemorrhage, or apoplexy, is inherited in the same sense as tuberculosis, and is a prominent factor of causation.

2. This tendency may remain latent until the age when various exciting causes begin to act, say from forty to seventy, or even eighty, but it is apt to appear earlier in each succeeding generation.

3. The so-called apoplectic constitution—the stout, thick-set build, with short neck and florid complexion—transmitted from one generation to another, is a myth, and has, *per se*, no bearing upon the etiology of the disease, except it is associated with some causative organic disease or habits of excessive indulgence.

4. This hemorrhagic tendency is increased by alcoholism, Bright's disease of the kidneys, especially chronic interstitial nephritis, hypertrophy of the heart, aneurism, embolism, a life of constant cerebral excitement like that of a speculator, broker or gambler, etc.

5. The constant use of alcoholic drinks in excess predisposes by inducing degeneration of tissues and low forms of inflammation of the small arteries; and by causing dilatation of the vessels by paralyzing the vasomotor nerves, which result in chronic congestion.

6. The greater frequency of apoplexy among males arises from alcoholism.

7. The applicant should be rejected if any symptoms suggest the probability of an attack.

8. He should be rejected also in case he has ever had any symptoms of an apoplectic seizure, no matter how complete his recovery seems to be.

PARALYSIS.

1. The tendency to general paralysis is often transmitted.

2. Every case of previous hemiplegia or paraplegia rejects the applicant.

3. Many cases of local palsy are entitled to insurance, provided the causes are local or capable of relief.

NUTRITION AND DIATHESIS.

CONSTITUTIONAL DISEASES

AND

DISEASES OF THE BLOOD AND BLOOD-MAKING ORGANS.

THE following are the principal diseases classified under this head, which will be considered briefly, and solely with reference to their bearing upon the rejection, postponement or acceptance of the applicant for insurance.

It must be remembered, however, that the executive officers of each company, after receiving full information from their Medical Examiner, always exercise the right to pass final judgment on the risk, and their action is largely governed by their personal experience, so that the following rules must not be considered absolute. They are simply intended as guides toward a correct judgment.

Rejections, Postponements and Acceptances.

Rejections.—The Medical Examiner's report to the home office should show clearly the grounds of rejection, or should be accompanied by a letter of full explanation, so that the executive officers may understandingly ratify or modify his decision, and take the responsibility therefor. All collateral documents go on file with the application.

Postponements.—All cases of postponement on account of physical disability require a certificate from the attending physician or surgeon after the completion of the cure, stating that the applicant is cured and free from prejudicial after-effects. Re-examination by the Medical Examiner should be required if the postponement continues for more than thirty days.

Acceptances.—The applicant is entitled to acceptance at the hands of the company when no cause for rejection or postponement is found; but the Examiner should give the company the benefit of any doubt for the protection of existing policyholders.

The diseases that require notice in this chapter, *seriatim*, are consumption, scrofula or struma, cancer and tumors, sarcoma and other malignant tumors, gout, rheumatism, syphilis and chancroid, insanity, epilepsy and convulsions, alcoholism or intemperance, apoplexy, paralysis, established extreme leanness or obesity, fatty or atheromatous degenerations, dropsy, anæmia, plethora, purpura, leucocythæmia, lymphadenoma or Hodgkins'

disease, indicated by a general enlargement of the lymphatic glands and spleen, with progressive anæmia, Addison's disease of the supra-renal capsules, and affections of the spleen.

CONSUMPTION.

This disease is so important from the life insurance point of view that we deem it necessary to review the leading facts of its etiology, pathology and symptoms. The diagnosis of this insidious disease in its stage of incubation will tax the highest powers of observation and comparison; and this is the stage which usually claims the attention of the Insurance Examiner, before the applicant himself is aware of his condition or danger. The latter may thus unconsciously mislead the Examiner by his blind answers to questions and by his entire ignorance of his own condition.

The Examiner must depend for success in diagnosis upon a thorough knowledge of the literature of the subject; experience in physical diagnosis, so that he can readily detect the slightest variation from the normal standard of pulmonary health; and a careful differentiation of the physical and subjective symptoms of the individual case under examination.

DEFINITION.—Consumption is "the collective expression for all the progressively destructive processes within the respiratory organs, or molecular death of the lung-substance, which do not occur successively and rapidly in the train of acute pulmonary inflammation."

VARIETIES AND SYNONYMS.—(1.) "Catarrhal consumption," or "chronic catarrhal pneumonia," where the disease is a continuation of a catarrhal pneumonia. (2.) "Fibrosis," "cirrhosis," or "induration of the lung," where connective tissue over-growth is prominent. (3.) "Tubercular," or "acute miliary tuberculosis," where millary tubercle is deposited within the lymphatic structure of the lungs.

MORBID ANATOMY.—*The Catarrhal Form* is characterized by a previous catarrhal, or lobar pneumonia, which has not been followed by resolution during the third stage, but whose products have become caseous. This caseous matter creates ulceration of the lungs by acting as a foreign body, and, possibly, induces miliary tuberculosis by absorption. In rare cases this caseous matter may become encapsulated and innoxious.

The Fibrous Form is manifested by (1) proliferation of new connective-tissue cells in the lung; (2) organization of these cells and formation of new connective-tissue; (3) contraction of this new connective-tissue, creating pressure upon the vesicular structures.

The Tubercular Form is produced by an absorption of caseous matter from some other part of the body, resulting in a lymphatic formation in the peri-vascular spaces of organs (especially of the lungs), which, under the microscope, shows giant-cells. The tubercular portions subsequently undergo ulceration and excavation (probably by the pressure exerted on the blood-vessels causing impairment of nutrition).

PREDISPOSING CAUSES*.—Hereditary or acquired constitutional debility; bad hygiene; damp, cold climate; badly drained or miasmatic soil.

EXCITING CAUSES.—Extension of a bronchial catarrh; pneumonia; subacute pleurisy or laryngitis; inhalation of irritating particles or gases; exposure to cold or sudden changes of temperature.

RATIONAL SYMPTOMS, in their order.—Incipient stage, constant elevation of temperature; emaciation, steady and gradual; loss of weight; characteristic clearness of complexion; flushing caused by exertion; pearly conjunctivæ; dyspnœa, after exertion; accelerated respiration and pulse.

Night-sweats, or ill-defined chills of the surface; clubbing of the finger-nails; peculiar cough; arrest of menstruation in females; increased sexual desire. *Later symptoms:* Steady cough; expectoration often streaked with blood, indicating lobular consolidation; hæmoptysis; pain in the chest, due to local pleurisy; indigestion; vomiting; partial aphonia, from ulceration of the larynx; hectic fever, when cavities are formed; cyanosis, when disease is extensive; diarrhœa, a bad symptom, due to indigestion, follicular ulceration of the intestines, etc.

PHYSICAL SIGNS.—*First Stage of Consolidation.—Inspection:* Prominent clavicles, flatness of the chest, unequal height of shoulders, depression in the infra-clavicular spaces, diminished expansion of the chest, etc. *Palpation:* Vocal fremitus increased. *Percussion:* Slight dullness, on one or both sides. *Auscultation:* Respiration rude or blowing; prolonged and high-pitched expiration (characteristic); râles, sub-crepitant, mucous, crepitant or metallic; intensified vocal resonance. These signs of the first stage are important, and comparison should be made between the two lungs.

Second Stage of Softening.—Inspection: Diminished expansion of the chest; respiration more frequent; marked depression above and below the clavicle. *Palpation:* Increased vocal fremitus. *Percussion:* Dullness increased (wooden). *Auscultation:* Bronchial breathing; abundant râles, circumscribed and bubbling; crackling sounds over certain areas.

Third Stage of Excavation.—Inspection: Retraction of chest-walls. *Percussion:* Dull, amphoric, or cracked-pot. *Auscultation:* Cavernous and bronchial respiration and gurgles; "cavernous whisper."

DIFFERENTIAL DIAGNOSIS.—From all forms of bronchitis; croupous

*An advocate of the germ theory epitomises his views of this disease, as follows: "Consumption is immediately set up by the bacillus accidentally implanted. We all inhale or ingest the contagium because of its ubiquity, but the same will not proceed to phthisis unless the soil be favorable. Favorable soil particularly occurs when the subject is (1) lean, with a dyspepsia for fats; (2) run-down or enfeebled from any cause; (3) prone to respiratory catarrh; (4) subjected to the breathing of confined and foul air. A tendency to that combination of innutrition and catarrhal habit that goes to make up a susceptibility to breed well the consumption-bacillus, is apt to run in families, and hence, and hence only, do we get the showings of a family obnoxiousness to phthisis. (Except where one member of a family nurses and sleeps with a consumptive, the disease may be lit up because of the overwhelming absorption of the contagium.)"

pneumonia, especially if at the apex of the lung or accompanying typhoid fever; pleurisy; pulmonary infarction, and hæmoptysis.

PROGNOSIS.—*Catarrhal Form:* In first stage may be arrested by change of climate and proper treatment. *Fibrous Form:* Prognosis good as regards duration of life under proper conditions; prognosis bad when complicated with laryngitis, pulmonary œdema, capillary bronchitis, pulmonary congestion or hemorrhage.

Tubercular Form.—Prognosis is most unfavorable.

REJECTION.—The actual presence of consumption, even in its incipient stage, as indicated by the family and previous history of the applicant, combined with the subjective symptoms and physical signs, absolutely rejects the candidate.

Inherited Taint.—The following conditions reject: (1.) The death of both parents, even at an earlier age than the present age of the applicant. With some companies the death of both parents rejects only during early and middle life, provided the person is of exceptionally robust physique and there were extenuating circumstances attending one or both cases of death. (2.) Three or more deaths in the immediate family, comprising a parent and two or more brothers or sisters older than the applicant, even though personal points favor. (3.) Two deaths of brothers or sisters older than the candidate, unless the individual conditions and environments are most desirable. (4.) When the applicant exhibits the tuberculous diathesis, although the family record shows no deaths from consumption.

POSTPONEMENT.—(1.) Death of one parent, or of more than one of the brothers and sisters, ordinarily postpones the applicant, otherwise acceptable, until he has reached the age of thirty. (2.) When the infant mortality in the family has been great, and the surviving members, including the applicant, are quite young, or he is the only survivor, he should be postponed until the age of thirty, when the expectation of life may be more accurately calculated, unless the physique and health record are above the average. (3.) The death of a grandparent, or parent of the same sex, suggests that the taint may appear in the applicant under exciting causes, and necessitates postponement until age and favorable personal points shall decide the case, unless the applicant's physique and health record are above the average. (4.) When the applicant resembles the tainted parent, though the disease is more commonly transmitted through the mother, postpone the risk as above, unless the physique and health record are above the average. (5.) When both parents have died comparatively young, the one from consumption and the other from cancer, abscess, erysipelas, intemperance, heart, kidney or nervous disease, the applicant doubtless inherits the taint of one or both parents, and should be postponed as above, or rejected.

ACCEPTANCE.—(1.) The single death of a brother or sister, when other points of family history and personal examination are favorable, should not prevent insurance.

(2.) When two deaths in a numerous family have occurred, the one of a parent over forty years of age, and the other of a brother or sister below the applicant's present age, if the examination presents no other objectionable features, there is no ground for rejection.

(3.) The risk may be accepted, after having been postponed for a period of from seven to ten years after a first attack of hæmoptysis, provided the Examiner is satisfied of the continuous good health of the applicant in the interim.

SCROFULA OR STRUMA.

POSTPONEMENT of all cases associated with this diathesis or cachexia, such as bone or joint disease. Caries or necrosis, Potts' disease of spine, hip joint disease, etc., extensive glandular swellings, abscesses of any size, such as the psoas or lumbar variety, and open ulcers or skin diseases depending on defective nutrition or vice of constitution must imperatively be postponed by the Medical Examiner. At the completion of cure, after the lapse of a safe interval, he must procure the certificate of the attending surgeon, to file with the application, before any form of insurance policy can be issued to the applicant.

CANCER AND TUMORS.

REJECTION.—(1.) When cancer and tuberculosis coexist in the family history the applicant should be rejected.

(2.) When two or more deaths have occurred in the family.

(3.) When any constitutional or local symptoms are present.

(4.) When there is a sarcoma or other malignant tumor.

POSTPONEMENT.—In cases of removal of benign tumors, six months after complete recovery from the operation, a surgeon's certificate as to the improbability of relapse and any evil after-effects is required and put on file with the application.

ACCEPTANCE.—(1.) The death of one parent from cancer, other points being favorable, should not debar the applicant from some form of insurance.

GOUT.

REJECTION.—(1.) The presence of chronic, recurrent gout, especially if it appears before the age of thirty-five, combined with an inherited tendency and improper personal habits, should always reject. (2.) When the inherited diathesis, though not manifested by typical attacks of gout, manifests itself by gouty degenerations in the heart, blood-vessels, kidneys or nervous system, causing organic disease, the risk should be rejected.

POSTPONEMENT.— (1.) When both parents, or a parent and grandparent, or an uncle and aunt, have had gout, the risk is hazardous, and should be postponed until the applicant is over thirty-five.

(2.) In cases of inherited or acquired gout, some companies require a

postponement of several years, during which period there must be entire immunity from the disease, correct personal habits, and favorable environment and physique.

ACCEPTANCE.—(1.) When one parent or grandparent has suffered from gout, the applicant himself having never had an attack, and being of good habits, if the physical examination be favorable, he is eligible for insurance.

(2.) If the applicant has passed the age of thirty-five without showing any symptoms of the disease, and if his physique is unobjectionable, even though two ancestors exhibit a history of gout, he is entitled to insurance.

RHEUMATISM.

REJECTION.—(1.) Acute or chronic rheumatism, which is long continued, recurrent, metastatic, hereditary, sciatic or syphilitic, in each case rejects. Owing to its recurring tendency under the ordinary exciting conditions, and to the fact that heart disease is a common sequel, the insurance company should always be given the benefit of the doubt. The unmistakable rheumatic diathesis and seizures are referred to above, and not other minor forms.

POSTPONEMENT.—(1.) It is customary to postpone the applicant with the inherited diathesis and history of repeated attacks for a period of seven years, or until that lapse of time has occurred since the last attack. (2.) One or more attacks, coupled with a family history of acute articular rheumatism, postpones the risk as above. (3.) One of the large companies places the minimum term of postponement at one year from the last attack of articular rheumatism.

ACCEPTANCE.—(1.) If no attacks appear before thirty-five, and the applicant is acceptable in other respects, he is eligible.

(2.) Muscular rheumatism and local rheumatic pains of a functional nature do not prevent acceptation of the risk.

SYPHILIS AND CHANCROID.

REJECTION.—(1.) The actual presence of symptoms of secondary or tertiary syphilis, absolutely rejects the applicant. (2.) Some companies include any history, past or present, of tertiary or inherited syphilis.

POSTPONEMENT.—(1.) In secondary syphilis, not followed by tertiary symptoms, the minimum term of postponement (by one company) is five years after the last manifestation.

(2.) All cases of hereditary or acquired syphilis should be postponed until the routine treatment has banished every trace of the disease for a term of years, to be proven by the attending physician's certificate.

(3.) CHANCROID.—In the case of this local disease, not followed by constitutional symptoms, the minimum term of postponement is six months,

and a surgeon's certificate of complete recovery is required and put on file with the application in the home office.

ACCEPTANCE.—When the force of the transmitted or acquired disease has been neutralized by proper treatment and a favorable environment, so that the applicant presents no traces of the disease, if unobjectionable in other respects, he is eligible; but the Examiner's action should be governed by the rules of the company for whom he is acting.

INSANITY.

REJECTION.—(Consult previous chapter on the "Transmission of Insanity," which explains hereditary influences, symptoms, etc.) (1.) Symptoms of insanity, actually presented to the Examiner, even of the incipient or masked type, most difficult of detection, should always reject. (2.) When the applicant's family history, with reference to insanity or other cerebral disease, is poor, and his own physical condition is below par, he should be rejected.

POSTPONEMENT.—(1.) All cases with the inherited taint should be postponed until adult life, when the life expectation can be more safely determined. (2.) When one slight attack is on record, postponement is required for a term of years, after the expiration of which period a physician's certificate to prove immunity from attacks in the interim must be furnished, which is put on file.

ACCEPTANCE.—(1.) Incidental or temporary insanity, unaccompanied by inherited taint or cerebral diseases, need not always deprive the applicant of insurance, if no symptoms have presented themselves for ten years.

EPILEPSY AND CONVULSIONS.

REJECTION.—(See section on "Hereditary Influences.") Confirmed epilepsy should always reject the applicant, on account both of the general impairment of health and of the imminent danger of accident during convulsions.

POSTPONEMENT.—(1.) Even after a long period of immunity from attacks, as the risk is hazardous from the liability to recurrence. (2.) Recurrent convulsions, unassociated with the history of transmitted epilepsy, temporary in character and of excentric origin, should postpone until all tendency to recurrence has disappeared.

ALCOHOLISM OR INTEMPERANCE.

REJECTION.—(Refer to the subject of "Inherited Tendency.") (1.) History of delirium tremens always rejects. (2.) The habitual drunkard should be rejected. (3.) Those cases which show the inherited taint, in both their history and present physical condition and habits. (4.) Most of the large companies absolutely reject all persons having anything to do with the retailing of alcoholic drinks. The Examiner should satisfy him-

self thoroughly whether the applicant keeps a hotel or place of business in which alcoholic drinks are sold over a bar, and should be governed in his rejections and acceptances by the rules of the company for whom he is examining.

POSTPONEMENT.—(1.) Intemperance (systematic or occasional), term of postponement according to the case. (2.) Reformed drunkards. (3.) All who exceed Anstie's daily allowance, equal to one and one-half ounces of absolute alcohol, should be postponed, and obliged to furnish satisfactory evidence of abstinence or temperance for a certain period of time.

ACCEPTANCE.—(1.) All who do not exceed the above daily allowance, and show no evil effects of stimulants upon the vital organs, may be insured. (2.) One great company accepts hotel-keepers, wholesale manufacturers and liquor dealers at one-half per cent extra premium rates.

APOPLEXY.

REJECTION.—(1.) Any history, past or present, of apoplexy, absolutely rejects. (2.) When any symptoms suggest the probability of an attack. The reader should consult the chapter on "Inherited Tendency to Apoplexy."

PARALYSIS.

REJECTION.—(1.) The presence of paralysis of any considerable part of the body, such as hemiplegia, paraplegia or paralysis from apoplexy, degenerations, softening, traumatic lesion or pressure of tumors, absolutely rejects. (2.) Also when conjoined with heart disease or the apoplectic diathesis; the most scrupulous care is requisite to detect irremediable causes. (3.) When not clearly explicable by temporary causes, it rejects.

POSTPONEMENT.—(1.) Local paralysis of certain parts depending on definite local causes, resulting in derangements of motion, such as Bell's palsy of the "portio dura"; aphonia; the muscular neuroses of the extremities from overwork in certain occupations, like "writer's cramp"; "wrist drop," from lead poisoning; traumatic local paralysis; reflex paralysis from deficient innervation and weakness; hysterical paralysis, mimicking organic diseases like tabes dorsalis, etc., all require postponement for a certain time, until the certainty of diagnosis is established, or cure is effected by proper treatment. A certificate is required from the attending physician to attest the recovery of the applicant. (2.) Paralysis of sensation or of special sense must be observed, in like manner, and its causation differentiated from any disease that would cause rejection. Postponement is necessary in all of these cases.

ACCEPTANCE is admissible in those cases where the cause of the paralysis is palpably local, such as paralysis resulting from the division of a nerve by a surgical operation or accident, pressure from a benign tumor, etc. The company, however, should always have the benefit of the doubt in every case.

LEANNESS OR OBESITY.

REJECTION.—Established, extreme leanness, or obesity, is sufficient ground for rejection by some companies, presaging, as either condition does, some organic disease, owing to abnormal nutritive changes. If the leanness was of rapid development, it may indicate grave constitutional disease, and in case of sudden obesity, fatty degenerations of the heart, liver or other vital organs may be found; and either contingency should absolutely reject.

POSTPONEMENT.—It is safer to postpone the majority of these extreme cases until proof of their eligibility in all other respects shall have overcome the prejudice against the risk.

ACCEPTANCE.—When it is certain, from the history and examination, that either of these peculiar physiological conditions did not take place rapidly, that it is rather a family and permanent trait than the expression of any tendency to disease, or result of the same, the risk may be accepted, provided all other conditions are favorable.

TISSUE DEGENERATIONS.

Various tissues in the course of disease become replaced with other formations less suited to the peformance of the original physiological and anatomical functions of the part. This transformation is called degeneration. Degenerations may occur by direct chemical metamorphosis, as of albuminous into fatty material; by infiltration of the tissues with some new material, as in albuminoid degeneration; and by substitution of a newly formed tissue, as in fibroid degeneration. It is closely allied to the process of atrophy, being caused by defective nutrition and becoming a part of progressive wasting. The following are the principal varieties: 1. Albuminoid, or granular or parenchymatous degeneration. 2. Fatty metamorphosis, infiltration or degeneration. 3. Cheesy degeneration or caseation, 4, Hyaline, fibrinous or croupous degeneration. 5. Mucous degeneration. 6. Colloid. 7. Amyloid, waxy or lardaceous. 8. Calcification, ossification, putrefaction or atheromatous degeneration. 9. Pigmentation.

REJECTION.—Whenever any one of these degenerative changes is imminent or in progress, the rejection of the applicant is imperative. Fatty degeneration of the vital organs or atheromatous changes in the blood vessels are recognizable, the former from feeble circulation and general debility, and the latter from the characteristic hardening of the arteries.

DROPSY.

Dropsy is the common term used to denote the transudation of fluid through the walls of the blood vessels into the cavities or tissues of the body. Exudation is the term used for this condition when it accompanies inflammation; effusion, for the same process associated with non-inflammatory affections. Dropsy of the various forms, ascites, œdema,

anasarca, etc., is a symptom either of grave organic disease or of a local affection which may readily be removed. When present at the time of the examination, much discrimination is required to determine the cause.

REJECTION.—When dropsy is a concomitant of organic disease of the kidneys, heart, liver, lungs or other organs; of chronic peritonitis; or when any of the constitutional cachexias coexist with it, rejection should be the invariable rule.

POSTPONEMENT.—In all doubtful cases, postpone and require a physician's certificate that the cause is removed.

ACCEPTANCE.—In some instances it follows malaria, fevers, peritonitis, acute disease of some one of the organs, etc; and when satisfactory evidence presents itself that the condition is fully cured, insurance may be granted.

ANÆMIA.

Anæmia signifies impoverishment of the blood, both in quantity and quality, either from lack of blood-making power or from waste after the blood is formed, and consists of a deficiency of red corpuscles and albuminous material.

Causes.—(1.) An insufficient supply of blood from lack of food, indigestion, functional derangement of lymphatic and blood glands, bad hygienic surroundings, or from the influence of certain poisons, such as lead, mercury, narcotics, malaria, etc., or from heart disease, aneurism, etc. (2.) Excessive depletion of the blood by hemorrhages, profuse catarrhal, suppurative or albuminous discharges, by rapid growth, frequent pregnancies, excessive lactacion, over-exercise, fever or new growths. (3.) A combination of the above causes may exist, as in the chronic constitutional diseases, such as nephritis, consumption, syphilis, cancer, etc.

Symptoms.—Although this affection is said to be most prevalent among girls and young women, it is common enough among all classes to deserve the attention of the Insurance Examiner, and often coexists with the strong physique and fatty diathesis. The general symptoms are pallor, weakness, feeble circulation, palpitation after exertion, cold extremities, often an anæmic heart murmur, poor appetite, indigestion, headache, mental and physical lassitude, etc.

REJECTION.—Extreme cases, such as those mentioned above, which accompany chronic constitutional diseases, and also that peculiar form called progressive pernicious anæmia, absolutely reject.

POSTPONEMENT.—Anæmia produced by any of the causes in the first category, and, in fact, any case exhibiting marked symptoms, should be postponed and referred to the family physician for treatment, with the recommendation to reapply for insurance after recovery is fully established.

ACCEPTANCE.—In many instances when the anæmia is slight and of an idiopathic nature, the condition need not delay the issue of a policy.

PLETHORA.

This affection is the opposite of anæmia, and not as frequent. Plethoric persons have a superabundance of red corpuscles in the blood, from either inherited or acquired causes, usually due in either event to high living and neglect of physical exercise. The general symptoms are florid complexion, prominent blood vessels, full, strong pulse and forcible cardiac action, excitable temperament, excess of urates in the urine, etc. Plethora renders the individual liable to acute inflammations, atheromatous degeneration of the arteries and consequent apoplexy.

REJECTION.—It is advisable to reject all applicants of this plethoric habit who are over-weight, given to excesses in eating and drinking, who lead a life of excitement and pleasure, and neglect open-air exercises.

POSTPONEMENT.—Postpone for a sufficient period that quota of plethoric applicants whose occupation, environment and pledges afford a warrant that due self-control will eventually prove sufficient to counterbalance this abnormal tendency.

ACCEPTANCE.—It is not unsafe to accept those candidates of full habit, who are otherwise insurable, who are confirmed in habits of temperance at business, at the table and during the hours of recreation and exercise. They are likely to reach old age.

PURPURA.

Purpura is the general term applied to circumscribed cutaneous hemorrhages, occurring either with or without constitutional symptoms. It seems to depend on weakness in the walls of the smaller blood vessels, combined with excess of fluid and salts in the blood.

REJECTION.—"Purpura hemorrhagica," which is accompanied sooner or later by dangerous internal hemorrhages and effusions of blood underneath the mucous membranes, is always ground for rejection.

POSTPONEMENT.—"Purpura simplex" and "rheumatica" require postponement until complete recovery ensues.

LEUCOCYTHÆMIA.

REJECTION.—"Leukæmia" is another name for this affection, which consists of an enormous increase of the white corpuscular elements of the blood often equaling in number the red corpuscles, when the ratio should be one white, to 350 red, in a state of health. It is associated with disease of the spleen, lymphatic glands and medulla of bone; and as it is eventually fatal, the rule of rejection must apply to all such cases. Microscopical examination of the blood will confirm the diagnosis.

HODGKIN'S DISEASE.

REJECTION.—"Lymphadenoma," and "pseudo-leukæmia," are other synonyms for this disease, which resembles leucocythæmia, and is generally

fatal. There is a general enlargement of the lymphatic glands and spleen, with progressive anæmia, but the white-blood globules are not relatively increased. Rejection is imperative.

ADDISON'S DISEASE.

REJECTION.—Addison's disease of the supra-renal capsules is a fibro-caseous degeneration, and proves fatal within two or three years at most. *Symptoms:* Marked anæmia, pearly conjunctivæ, a peculiar bronzed discoloration of the skin, most marked on the face, neck, arms and genital organs; extreme weakness, feeble pulse, and gastro-intestinal disturbances. As a matter of course, the Examiner is not likely to encounter any of these grave diseases—except in the stage of invasion—but for that very reason he should be all the more on his guard against accepting them.

Rejection is imperative.

DISEASES OF THE SPLEEN.

REJECTION.—True inflammation of the spleen is exceedingly rare. All enlargements of that organ associated with enlargements of lymphatic glands, leucocythæmia, Hodgkin's disease, cirrhosis of the liver, consumption, etc., increase the necessity for rejection.

POSTPONEMENT.—Enlargements of the spleen dependent upon the malarial cachexia demand postponement.

SKIN DISEASES.

REJECTION.—Manifestations of inherited or tertiary syphilis, according to the rules of a leading company, totally reject. Cutaneous traces of any malignant disease also reject.

POSTPONEMENT.—When there are symptoms of secondary syphilis, not followed by tertiary symptoms, the minimum term of postponement by one company is five years from the last manifestation; for chancroid the minimum term is six months. Erysipelas, open ulcers, severe boils, abscesses, carbuncles, etc., and all grave skin eruptions postpone until a physician certifies in writing that the cause is removed and complete recovery has taken place.

ACCEPTANCE.—Simple and non-diathetic affections of the skin do not prevent acceptance.

DISEASES OF SPECIAL SENSE.

REJECTION.—Loss of sight or hearing from causes associated with organic or nervous disease is ground for rejection.

POSTPONEMENT.—Otorrhœa, or uncomplicated diseases of the eye, postpone until complete cure is effected.

ACCEPTANCE.—One company accepts cases of total, uncomplicated deafness or blindness, but charges one-half per cent extra premium.

NERVOUS DISEASES.

Diseases of the nervous system, at least in their acute or sub-acute stages, will seldom come under the observation of the Medical Examiner for life insurance. We shall, therefore, make no attempt to classify all of them ; but it is necessary to consider certain abnormal states of the cerebro-spinal system, as well as some chronic forms of nervous disease, which may engage his notice. It will be incumbent upon him to employ the laws of "exclusive diagnosis" in many of these perplexing cases, which will determine whether rejection shall follow when they are traced back to an organic disease, or postponement and final acceptance, if they prove to be of a functional nature.

HEADACHE.

Headache differs in location, degree of pain, causation, duration, etc. Varieties, according to causes, are : (1.) From cranial or structural causes, depending on diseases within the cranium. Headache arises from anæmia, congestion, thrombosis, or embolus of the cerebral capillary arteries, and as a symptom of impending cerebral apoplexy ; from inflammatory diseases, such as meningitis of all kinds, cerebritis, cerebral abscess and softening, caries and necrosis ; from tumors of the brain and meninges ; from cerebral concussion, etc. (2.) Reflex causes ; sick headache, "migraine," or "megrim," from abnormal states of the stomach, liver, uterus, or from pregnancy. The pain in this variety is usually confined to one side of the head and is of a periodical nature. Constipation and excessive venery are other reflex causes. (3.) Blood causes; toxæmic headache. All the fevers and infections, contagious diseases, blood-poisoning or degeneration, malaria, diathetic diseases, organic diseases, chemical poisons, alcohol, medicines, etc.

REJECTION.—Causes of the first class from intracranial organic disease necessitate rejection, as a rule, and the same is true of many incurable toxæmic cases.

POSTPONEMENT.— Reflex causes, when present at the examination, as well as those of the third, toxæmic class, require disqualification until the causes shall have been removed by appropriate treatment.

ACCEPTANCE.—Mild forms of headache, functional in character and unassociated with any of the above serious causes, are unimportant in estimating the risk.

VERTIGO.

Vertigo, or dizziness, is defined as the consciousness of a disordered state of equilibrium in the body, which ordinarily maintains its poise through the control of the sensory-motor centre in the cerebellum. Noises in the ears usually accompany the vertigo: Varieties: 1. Vaso-motor, due to local or general variations in the blood-pressure within the vessels, from vaso-motor influence ; in such diseases as sunstroke, anæmia, gout, etc. 2. From the effects of drugs like quinine, salicin, the salicylates, etc. 3. From ocu-

lar disorders, often mistaken for organic cerebral disease. Paralysis of any of the ocular muscles produces disorder of sight as regards external objects, and vertigo ensues. 4. Auditory or aural vertigo (Ménière's disease), caused by perversion or abeyance of the labyrinthine function of the ear. 5. Gastric; caused by derangement or diseases of the stomach. 6. Nervous vertigo, accompanying nervous exhaustion or depression, from over-work or excessive indulgences. 7. The epileptic form, which precedes, or is associated with, an epileptic fit. 8. Migrainous vertigo, constituting one of the phenomena of sick headache. 9. Vertigo, due to organic disease of the nervous system. 10. Gouty vertigo, which appears with attacks of gout.

REJECTION.—It is obvious that this disorder, when caused by incurable organic disease, must always be a cause of rejection.

POSTPONEMENT.—Most of these causes of vertigo are amenable to treatment, and will not prevent acceptance at the expiration of a sufficient interval.

HYSTERIA.

Hysteria is the word employed to denote certain nervous phenomena resulting in convulsive seizures and alterations of functions in various organs, causing many perplexing symptoms and often simulating those which arise from real organic disease. In most cases these alarming manifestations are immediately excited by the influence of some strong mental or emotional impression.

REJECTION.—The Examiner should be careful to differentiate the symptoms of hysteria from those caused by structural, spinal or cerebral lesions, or incurable ovarian or uterine diseases, which render insurance out of the question.

POSTPONEMENT.—Cases dependent upon curable ovarian or uterine complaints, require postponement.

ACCEPTANCE.—Many applicants, in spite of marked symptoms of hysteria, are eligible for insurance, provided the examination fails to reveal evidence of actual disease and the person is in good general health.

DERANGEMENTS OF MOTION.

The character of this manual makes it undesirable to attempt an exhaustive classification and enumeration of nervous diseases. We give a simple account of those affections likely to be met with in the examining room, with their prominent causes, symptoms and rules for deciding the risk. The presence of abnormal nervous manifestations traceable to an organic lesion rejects the applicant; but these disturbances are often due to disorders of the digestive organs, to reflex influences eventually removable, in which event suitable postponement may allow of ultimate acceptance.

Derangements of motion may be of either the voluntary or involuntary muscles.

TREMORS.

REJECTION.—Tremor, or tremulousness rejects: (1.) When the methods of exclusive diagnosis unmistakably refer these muscular agitations to central lesions. (2.) When it is associated with marked impairment of vitality or premature old age. (3.) When coexisting with evil habits, such as the use of opium, alcohol etc., or with extreme metallic poisoning.

POSTPONEMENT.—In case it is merely and obviously the result of individual idiosyncrasy or advancing age without other adverse features, or is due to reflex causes amenable to treatment, the applicant may be postponed or accepted, according to the circumstances.

CONVULSIONS, SPASMS OR FITS.

These morbid manifestations, including chorea, are not infrequent among males, as well as females, of an excitable nervous temperament.

REJECTION.—Rejection applies to all cases due to central causes, such as brain disease, tumors or growths, hemorrhages, etc.

POSTPONEMENT.—Cases due to excentric causes, such as dental, intestinal, uterine, or vesical reflex irritation, vitiated blood, retained excreta or chemical poisons, and the like, deserve postponement, or final acceptance, as the case may be.

If these convulsive seizures of any kind have not recurred for several years, the risk may be good, especially if in the case of males the applicant has passed the age of twenty-five, or if females are over twenty-three, which periods mark the crisis of such a diathesis.

(See under head of "Epilepsy and Convulsions," in the sections on "Hereditary Influences" and "Nutrition and Diathesis," Part III.)

EPILEPSY.

(See sections on "Hereditary Influences" and "Nutrition and Diathesis," Part III.)

DEFECTIVE CO-ORDINATION OF MOVEMENTS.

(See "Epilepsy and Convulsions," in section on "Nutrition and Diathesis," Part III.)

Chorea comes under this head, like the neuroses dependent upon certain occupations, and should be judged according to the individual case.

RIGIDITY OF MUSCLES.

REJECTION.—This affection is allied to paralysis and often betokens softening of the brain or other organic disease.

POSTPONEMENT.—When evidently due to local troubles which time and treatment may remove, delay in decision is recommended.

PARALYSIS.

(Consult "Paralysis" in sections on "Hereditary Influences" and "Nutrition and Diathesis," Part III.)

DERANGEMENTS OF SENSATION.

These morbid sensations are not as grave in import as paralysis of motion, and do not usually imply structural or inflammatory disease, being more related to the emotions. Pain is the leading derangement, often coexisting with a feeling of heat, cold, pressure, itching, tingling, etc.

REJECTION.—Diminished sensation, or extensive anæsthesia, may indicate, more directly than derangements of motion, some central nerve lesion or the effects of poison. Exclusive diagnosis will alone establish this fact and determine rejection. The same may be said of disorders of the special senses.

POSTPONEMENT.—If undoubtedly arising from local influences, blood poisons or diseases, skin diseases, etc., these derangements may prove nothing more serious than a temporary cause for postponement.

LOSS OF CONSCIOUSNESS OR SYNCOPE.

Syncope is a state of suspended consciousness due to sudden failure of heart action. Causes—(1.) Intrinsic cardiac conditions generally accompanying organic heart disease, especially fatty degeneration. Other causes of this form of syncope are, pressure from tight articles of dress, excessive heat or sunstroke, lightning stroke, drugs like chloroform. (2.) Nervous syncope, due to sudden emotion, fear, grief, joy, concussion of the brain; to reflex causes from morbid conditions of the stomach or intestines, such as indigestion or worms; from the liver, kidneys or uterus; to painful injuries, or to spasm of the arteries from vaso-motor impressions. (3.) Blood causes, most commonly from hemorrhage, anæmia, or from serious constitutional diseases. (4.) Complex causes, which occur in cases of hunger and exhaustion; railway accidents, where fear, pain, shock, injury and hemorrhage may combine to produce syncope; also a hot, impure atmosphere. Persons afflicted with the predisposing causes often lose consciousness from trifling exciting causes.

REJECTION, POSTPONEMENT OR ACCEPTANCE of a candidate with a history of syncope will depend upon its causes, as laid down above, present physical condition and prognosis of the individual case.

DISEASES OF THE BRAIN.

The commonest forms of diseases within the cranium, which may be presented to the Examiner, are chronic encephalitis, meningitis, growths or tumors, atrophy, hypertrophy or softening of the brain, chronic cerebral poisoning, insanity and apoplexy.

ENCEPHALITIS.

REJECTION.—Encephalitis, or cerebritis, with meningitis in the acute and sub-acute stages, are diseases of the sick-room, but when chronic in character and causing slight general disturbance of health, they may be encountered

by the Examiner. There may be a history of some injury to the head, or of disease tending to affect the brain; some impairment of tne special senses; abnormal pulse, hesitation in speech, headache, or general malaise, stiffening of muscles, or some absurd mental manifestations; these symptoms should lead the Examiner to locate the cause accurately and reject the applicant.

CEREBRAL DEPOSITS, GROWTHS OR TUMORS.

REJECTION.—These conditions are often difficult of exact localization, but all that is required of the Examiner is to demonstrate their existence from the symptoms presented, from the history, diathesis and cachexia of the individual. Every case requires rejection. The ordinary symptoms are headache, nausea, mental disturbances, partial paralysis and epileptiform convulsions.

CEREBRAL ATROPHY.

REJECTION.—This affection is usually a disease of advancing age, but may occur earlier, and is caused by any condition that retards the supply of blood to the brain, such as the pressure from tumors, growths, embolism and ligation of arteries. It results in dementia.

CEREBRAL HYPERTROPHY.

REJECTION.—This rare affection is occasionally noticed in young adults, and is usually associated with premature hardening of the bones of the cranium. These subjects have brittle bones, present a history of fractures and certain symptoms of cerebral disturbances.

SOFTENING OF THE BRAIN

REJECTION.—Chronic softening of the brain, or "ramollissement," is one of the most insidious diseases in its approach to that obvious phase, when no physician could mistake it. In the earlier stages, the Examiner is likely to be greatly perplexed by it.

Causes.—It may be the sequel of acute inflammation or premature senility, mental shock, prolonged anxiety or over-work. It may also come on gradually as the result of local or general tissue degenerations, such as malnutrition, arteritis, embolism, deposits, fatty degeneration, etc. *Symptoms.*—Though these are not infallible, some of the significant early symptoms are headache, vertigo, impaired intelligence, memory and articulation; nervousness, hypochondria, dullness of the special senses; strange sensations, pain or numbness in the limbs, local cramps or rigidity of certain muscles, feebleness of body and mind, decided change of the general temperament, and frequently constipation, nausea and vomiting, with diminished sensibility of the bladder. Sometimes there will be a history of some accident or illness, from which the affection vaguely dates. The physiognomy of a typical case once seen will never be forgotten. Methods of exclusive diagnosis should be employed to settle difficult points in each

case, and determine rejection. An analogous cerebral condition often follows complete sunstroke.

SUNSTROKE, INSOLATION.

Three varieties—(1.) Simple heat exhaustion; syncopal form, from failure of the heart's action. Death threatens from collapse and cardiac paralysis. (2) Asphyxial form, true sunstroke; asphyxia and apnœa ensuing from nervous shock following exposure to extreme heat, when the nervous system is prostrated from any cause, such as fatigue or dissipation. (3.) The hyper-pyrexial form, intense fever from over-heating, paralysing the nerve-centres, and secondarily the vaso-motor nerves of the arteries. This form comes on night or day as a result of over-exercise, intemperance, weakness, or foul air, and the temperature of the body may exceed 110° F.

About fifty per cent of cases of the last two varieties die, the rest remaining more or less invalidated, or ultimately succumbing to nervous diseases superinduced by the insolation.

REJECTION.—Any history of either of the latter forms of insolation, or symptoms presenting which point in that direction, should reject for palpable reasons.

ACCEPTANCE.—History of the first form of syncopal insolation, if fully recovered from, is not a bar to insurance.

CHRONIC CEREBRAL POISONING.

REJECTION.—This morbid organic condition often follows the habitual and excessive use of alcoholic and other nervous stimulants of all kinds: Opium, chloral, bromides, cocaine, "hasheesh," tobacco, tea, coffee, etc. The victims of these baleful habits, though apparently in fair health, cannot endure any physical or mental strain, or bear to abstain from their indulgences. Without showing any well-defined disease, they are wont to complain of mental and physical lassitude, suffer from insomnolence and are conscious of a general deterioration. They are suffering from chronic, poisonous changes going on within the minute tissues of the brain and nervous system, the symptoms of which are readily recognizable by the Examiner, and, on account of the uncertainty of reformation, they should in almost every instance reject the applicant.

POSTPONEMENT is admissible in certain cases that seem to be on the safe side of the border line of this prevalent malady, and which promise wholly to remove the exciting causes.

NEURASTHENIA.

Neurasthenia is not to be accepted as a distinct affection, but should be regarded as a condition of bodily exhaustion, frequently associated with various chronic disorders and sometimes with perverted functions of the nerve-centres.

Causes.—Former diseases, over-work, excessive mental emotions, inherited tendency, etc. The symptoms are general and local manifestations of nervous exhaustion.

REJECTION is demanded when the applicant's condition is incurable.

POSTPONEMENT is the rule when delay and proper treatment are likely to bring about an insurable state of health.

Dipsomania, delirium tremens, intemperance, alcoholism—synonymous terms—insanity, apoplexy. (See former sections in Part III. on "Hereditary Influences" and "Nutrition and Diathesis.")

DISEASES OF THE SPINAL CORD,

SPINAL INFLAMMATION.

Symptoms.—A fixed pain along the vertebral column, which is aggravated by movements of the body, local pressure and the application of heat. There may be spasms or paralysis of the muscles of the back, and frequently curvature of the spine.

REJECTION.—Rejection must follow chronic inflammation of the meninges or substance of the spinal cord. It must be distinguished from rheumatic and neuralgic conditions.

SPINAL IRRITATION.

REJECTION is the safest course in all well-marked instances of spinal irritation, with its array of symptoms, involving nervous hyperæsthesia and excitability, and remote disturbances of the digestive, thoracic and cerebral organs.

SPINAL PARALYSIS.

REJECTION, without exception. (See Part III., sections on "Hereditary Influences" and "Nutrition and Diathesis.")

LOCOMOTOR ATAXIA.

REJECTION in all clearly defined cases. Progressive locomotor ataxia, or "tabes dorsalis," is due to sclerosis of the posterior columns of the spinal cord. It begins insidiously, progresses slowly, and is apt to puzzle the observer during the period of its onset. The initial symptoms are, seriatim: Wandering, brief, sharp pains in the lower extremities, associated with disturbances of vision, inequality of the pupils, and possibly paralysis of the third or sixth pair of nerves; vertigo, with difficulty in maintaining the equilibrium from defective co-ordination, shown in the impaired gait and inability to stand or walk with the eyes closed; the ground does not feel natural to the feet; muscles are well nourished and respond to electricity, and the patient can kick vigorously; feeling of a girdling cord about the waist; mind unaffected; loss of sexual power may be an early symptom.

Later symptoms: progressive loss of sight, hearing and articulation, atrophy of muscles, dropsy and swelling of joints.

DISEASES OF THE RESPIRATORY ORGANS.

(For methods of physical diagnosis in respiratory diseases, see Part II., "Examination of the Chest;" also refer to Part I., "Insurance Formalities," and "Instructions to Medical Examiners.")

CATARRH.

Catarrhal inflammation of the mucous membrane of the respiratory passages, whether of the acute, sub-acute or chronic type, is sufficiently common in our variable climate to make it a subject of careful investigation by the Examiner.

Varieties.—Acute (coryza), or chronic nasal catarrh; morbid nasal growths connected with it; pharyngitis; tonsilitis or quinsy, chronic sore throat, throat ulcers, etc.

REJECTION is safest whenever there is any evidence pointing to constitutional cachexia, or hereditary tendency to disease, accompanying a chronic catarrhal condition.

POSTPONEMENT.—Postpone every case when the catarrh is present and appears to be undermining the general health of the applicant, spreading to the mucous membranes of the lungs, or associated with morbid nasal growths, chronic sore throat, ulcers or tonsilitis.

ACCEPTANCE.—Mild catarrhs of a local and functional character in a person of good history and physique do not debar. Always examine the throat in catarrhal cases with a tongue-spatula or laryngoscope.

CHRONIC SORE THROAT.

Pharyngitis of the chronic form results in thickening of the mucous membrane above the tonsils and the formation of ulcers. It may be caused by disorders of the stomach with acid eructations, and keeps the patient constantly hacking and clearing the throat. It is common among clergymen and sedentary people, who breathe bad air and disregard considerations of proper diet and exercise.

THROAT ULCERS.

Chronic ulceration of the throat is of grave import and may be idiopathic, syphilitic or tuberculous. Examine the parts carefully in all cases.

REJECTION.—Reject all cases of chronic sore throat or ulceration which point to scrofulous, consumptive, syphilitic, or other vice of constitution.

POSTPONEMENT.—Postpone all doubtful and idiopathic cases until the diagnosis or cure is established.

MORBID NASAL GROWTHS.

POSTPONEMENT.—These cases should be postponed until, by removal of the growth or by the progress of the disease, it can be correctly determined whether the applicant should be rejected or not. If accepted finally, the Examiner must be satisfied that the growth is non-malignant and non-recurrent.

TONSILLITIS OR QUINSY.

POSTPONEMENT.—The gravity of this affection depends on the frequency with which it is the concomitant of the tuberculous diathesis or general debility. The case should be postponed until its nature is demonstrated.

ACCEPTANCE.—Mild cases of the non-ulcerative variety, which do not recur with frequency or deteriorate the general health, may be accepted.

DIPHTHERIA.

Diphtheria, like scarlet and other fevers, is not likely to be seen by the Insurance Examiner, but its serious sequelæ must be searched for in the person of any applicant who has had the disease. There are various forms of paralysis, albuminuria, dropsy, the tuberculous diathesis, etc., the presence of which, as after-effects of diphtheria, is sufficient ground for rejection.

DISEASES OF THE LARYNX.

POSTPONEMENT.—These comprise the various neuroses, perversions of sensation, disorders of motion, paralysis and paresis of the muscles and of the vocal cords, and demand postponement.

APHONIA.

CAUSES.—Neurosis and nervous disorders of the larynx, such as hysteria or hypochondria; organic disease of nerve centres; paralysis of muscles from abuse of the voice; new growths; poisonous influences of drugs like lead, belladonna, stramonium; mechanical causes; rheumatism; aneurism; consumption; syphilis, etc. Presence of the graver causes is ground for rejection; of the others for postponement.

CHRONIC LARYNGITIS.

POSTPONE all cases that seem to be idiopathic.

REJECT all obstinate cases which have undermined the health and suggest a scrofulous, consumptive, syphilitic or malignant cause.

DISEASES OF THE BRONCHI AND LUNGS.

ACUTE DISEASES.

POSTPONE in every instance. Re-examination will demonstrate if any lesions are left behind.

(Review the sounds of normal respiration and the contour of the thorax

Part II., "Examination of the Chest." and notice any departure from the standard.)

PAIN IN THE THORAX.

CAUSES.—Affecting the respiratory organs. *In the Lung.*—Bronchitis, pneumonia, cancer, abscess, infarction, phthisis, obstructions in the bronchi. *In the Pleura.*—Pleurisy, pneumo-thorax, hæmo-thorax, cancer. *In the Mediastinum.*—Tumors, diaphragmatic hernia. Affecting the *heart* and *pericardium*, pericarditis, pneumo-pericardium, hæmo-pericardium, cancer, myocarditis, ulcerative endocarditis, angina pectoris, cardiac neuralgia. Affecting the walls of thorax. *Surgical Conditions.*—Contusions, traumatisms, fracture of the ribs or of the vertebræ. *Diseased Conditions.*—Intercostal neuralgia, muscular rheumatism, abscess, cancer or tumors of thoracic walls, stricture of the œsophagus. *Abdominal Causes.*—Dyspepsia; pressure upward by any organ. (From Moir's "Manual of Medicine.")

COUGH.

Definition.—Cough is a spasmodic, expiratory effort, associated with a contraction of the diaphragm, by which nature endeavors to remove some source of irritation, or expel some abnormal substance from the respiratory tract. *Varieties.*—According to origin, it may be laryngeal, tracheal, bronchial or nervous and sympathetic. According to the amount of expectoration, it is dry or moist, etc. A dry cough is said to be irritating, nervous, sympathetic, tight, hollow, barking, brazen, hacking, tickling, short, sharp, hoarse, shrill, whistling, stridulent, paroxysmal, whooping, distressing, etc., and expectoration is usually absent or scanty. The moist cough is termed loose, deep, soft, paroxysmal, labored, prolonged, distressing, etc., as the case may be. *Various Affections.*—A dry cough indicates irritation, and is heard early in affections of the uvula, pharynx, larynx, trachea, in bronchitis and pleurisy, sometimes it is caused by affections of the liver, stomach, intestines, uterus or brain, by dentition, presence of worms, or diseases of the circulatory organs, again, it may be nervous. Most sympathetic coughs are dry. Cough is said to be dry, hollow and hacking in nervous and sympathetic affections; tight, shrill, hoarse, whistling, stridulent, tickling, in affections of the larynx and trachea; dry and brazen in hysteria, dry and tight in early bronchitis; barking in incipient phthisis; short and sharp in pneumonia and emphysema; barking and hoarse in early or spasmodic croup; whistling in advanced membranous croup paroxysmal and whooping in pertussis; paroxysmal in asthma, and often so in laryngeal affections, abscess of the lung and consumption. The moist cough rarely occurs except in diseases of the respiratory organs, and depends upon the presence of secretions in the bronchial tubes or lungs. It is soft, deep and loose in advanced bronchitis; with free secretion in œdema of the lung and last stage of pneumonia; deep and distressing in

chronic phthisis. It is generally associated with profuse expectoration, which varies in appearance according to the disease.

Cough is often increased or diminished by changes in position; the recumbent posture generally intensifies it.

REJECTION.—Habitual coughs caused by any chronic and incurable disease of the organs of respiration should reject

POSTPONEMENT.—Postpone all doubtful cases of habitual cough until the diagnosis or cure is settled. If the habitual cough is merely reflex or functional, and not connected with any chronic or incurable disease of the air passages, it should not debar the applicant from insurance.

DISPNŒA.

Definition.—Dispnœa means difficult breathing or habitual shortness of breath, and is the term commonly used to denote any disorder of respiration.

Varieties.—(1.) Deficient respiration; *e. g.*, slow, restrained, shallow and ineffectual breathing. (2.) Dispnœa; obstructive breathing, excessive breathing or ordinary dispnœa, shortness of breath, expiratory dispnœa, orthopnœa (which indicates that the patient can only breathe comfortably in a sitting posture), paroxysmal dispnœa. (3.) Peculiar disorders; *e. g.*, breathing peculiar to certain nervous complaints, the interrupted, jerky, sighing or yawning respiration; Cheyne-Stokes respiration of cerebral hemorrhage, heart disease, especially fatty degeneration, and injury to the brain; this is characterized by breathing which becomes more and more rapid and deep up to a certain point, then gradually decreases and finally pauses for an interval.

Causes.—(Moir's Manual.) Dispnœa is due to some mechanical interference with the free entrance of air to the lung. *Causes above the Larynx.*—May result from pressure on the facial nerve, from obstruction in the nares, suppurative, tonsillitis, retro-pharyngeal abscess, cancer or other tumor of the mouth or pharynx, or foreign bodies in the pharynx. *Causes in the Larynx.*—Laryngitis, various forms—œdema glottidis, laryngismus stridulus, laryngeal tumors and paralysis, pressure upon, or foreign bodies in, the larynx.

Causes in the Bronchi.—Bronchitis, various forms, asthma, foreign bodies, hemorrhage, pressure and dilatation. *Conditions of the Lungs.*—Emphysema, pneumonia, phthisis, œdema, congestion, infarction, apoplexy, abscess, cancer, gangrene, atelectasis, compression. *Conditions of the Pleura.*—Pleurisy; acute, subacute and chronic or empyema, pleuritic adhesions, hydro-thorax, pneumo-thorax, hydro-pneumo-thorax, hæmo-thorax, cancer.

Conditions of the Heart.—Pressure on the heart, enfeebled action, mitral disease, rupture of valves, angina pectoris, cardiac dilatations, fatty heart, myocarditis, endocarditis, ulcerative form chiefly, accelerated action. *Conditions of the Pericardium.*—Pericarditis with effusion, adhesions, pneumo, hydro, hæmo-pericardium, cancer, pus in the pericardium. *Conditions of the*

Large Vessels.—Aneurism of the arch of the aorta by pressure on the lung. Aneurism of the pericardial sac by pressure on the heart, air in the veins. *Conditions of Air Respired.*—Deficiency of oxygen, too high altitudes, deleterious substances and impure air. *Conditions of Blood.*—Anæmia, chlorosis, poisons. *Conditions of the Nervous System.*—Diseases of the brain, of the upper part of the spinal cord, injury or pressure on the following nerves: Pneumo-gastric, phrenic, spinal accessory, laryngeal or cardiac; exhaustion, tetanus, hydrophobia. *Conditions Affecting the Parietes or Muscles of the Chest.*—Spasm of the muscles, all painful affections of the external structures, paralysis of the respiratory muscles, wounds or contusions of the soft parts, ossified cartilages, fracture of the ribs, dislocation or fracture of the spine. *Conditions Affecting the Diaphragm.*—Enlarged organs, pregnancy, tympanites, ascites, peritonitis, brain disease and tumors.

REJECTION.—Reject when the dispnœa is marked, permanent or due to uninsurable conditions.

POSTPONEMENT.—Postpone all cases, thus reserving an opportunity to re-examine the applicant and determine whether the dispnœa is nervous or a harmless idiosyncrasy.

CHRONIC BRONCHITIS.

Definition.—Chronic bronchitis is a low grade of catarrhal inflammation, tending to recur with increased severity and duration until it becomes permanent. The croupous form is still more serious. It may be limited to the larger tubes or extend to the capillary air vessels.

Causes, Predisposing.—Exposure to cold or wet, bad air, repeated acute attacks, constitutional diseases, such as gout, etc., and organic diseases. *Exciting Causes.*—Irritation from substances inhaled, mitral stenosis, chronic alcoholism. *Symptoms.*—Early stage—cough, expectoration muco-purulent, increasing in winter, decreasing in summer, finally becoming permanent. Later stage—violent cough, expectoration more offensive, soreness behind the sternum, dispnœa, fever, night sweats and emaciation. *Physical Signs.*—Inspection—respiration accelerated or labored. Palpation—vocal fremitus may be normal or abnormal. Percussion—normal or temporary dullness. Auscultation—vesicular murmurs deficient, respiratory sound harsh, expiration prolonged, large or small mucous rales, changed in character and position by the act of coughing or a full inspiration. Vocal resonance changeable. *Differential Diagnosis.*—From pleuritic effusions and consolidations of pneumonia or phthisis.

REJECTION.—Reject all cases traceable to constitutional or organic diseases, or complicated by the same; also when caused by any deleterious occupation, such as stone-cutting, needle-grinding, glass-blowing, or cotton-spinning.

POSTPONEMENT.—Recurring or chronic bronchitis, even when uncom-

plicated, because it materially impairs the expectation of life, should in all cases postpone the applicant.

ASTHMA.

Definition.—Asthma is a neurosis, which produces spasm of the involuntary muscular fibres of the bronchial tubes and consequent paroxysms of dispnœa. The symptoms are unmistakable—wheezing respiration, sibilant râles, etc.

REJECTION.—Long-continued attacks of asthma tend to overwork and strain certain organs, and when it unquestionably coexists with dilatation of the bronchial tubes, emphysema, pulmonary congestion or œdema, hæmoptysis, tuberculosis, hypertrophy and dilatation of the right side of the heart, thoracic tumors, aneurism, obstructed circulation or disease of the liver or kidneys, organic disease of the brain or spinal cord, etc., rejection is peremptory. And the same is advisable when hereditary predisposition is marked.

POSTPONEMENT.—When the causes of asthma are clearly excito-motor, nervous and reflex, such as mechanical and local irritants to the respiratory surfaces, depending on individual idiosyncrasy or climate; malaria; portal congestion; alcoholic stimulants; disorders of certain organs; nervous and emotional influences, etc., postpone until it can be demonstrated that the applicant can and will abate any of those conditions by removal of the cause, whatever it may be, so that his general health is not likely to be impaired thereby in the future.

ACCEPTANCE.—It must be borne in mind that most asthmatics who have no serious complications, enjoy fully an average expectation of life from the fact that they are compelled to lead a careful, hygienic life. But even if the Examiner is possessed of obvious evidence of such compensatory habits on the part of the applicant, the latter should not be accepted unless there is absolute freedom from all symptoms of the condition and no probability exists of a recurrence.

CONGESTION.

POSTPONEMENT.—Any acute or chronic congestion of the respiratory tract, necessitates postponement and subsequent re-examination. In this way we can safely determine whether certain departures from the normal standard of pulmonary health are functional and transitory, or due to tuberculous deposits.

EMPHYSEMA.

Definition.—(1.) Vesicular emphysema is the term used to express abnormal distension of the air vesicles of the lungs, the pressure obliterating some of the capillary blood vessels, interfering with the general circulation and mechanically straining the right side of the heart. (2.) It is called interlobular or interstitial when the vesicles have ruptured and allowed the air to infiltrate the areolar tissue between the lobules of the lung.

Causes.—The principal cause is mechanical over distension of the air-cells, either by forced inspiration or expiration, thus paralyzing the contractility of the air cells, and finally rupturing them. This may take place during the coughing paroxysms of chronic bronchitis, asthma, etc.; also from pressure of tumors upon the bronchial tubes; from organic disease of the heart, playing on wind instruments, over-exercise, as in running; remaining too long under water, as in partial drowning; from any hereditary or acquired impairment of elasticity of the lung tissue. Emphysema may be compensatory or secondary around small portions of the lung, which have been rendered inexpansible from disease. It is called vicarious when emphysema of the healthy lung is produced around large areas of consolidation or parts impaired by disease, as in atelectasis, from obstruction of a small bronchus, a lobar pneumonia or pulmonary infarction.

Symptoms.—Constant dispnœa, increased by exercise, coughing, or a cold climate; dusky countenance, distension of the nostrils and veins of the neck; feeble voice and pulse, weakness, emaciation, exhausting cough. *Physical Signs.*—Barrel-shaped chest, rising and falling movement during respiration, lack of expansion, displacement of the apex-beat, abdominal breathing. Vesiculo-tympanitic percussion notes; prolonged, low-pitched expiratory sound, from loss of elasticity of the lung tissue, with feeble inspiratory sound. *Complications.*—Heart disease, chiefly of the right side, bronchitis, asthma, fatty degeneration of organs, disease of the kidneys or liver from obstruction of the general circulation. Differential diagnosis, from pneumo-thorax.

REJECTION is demanded in every case of marked emphysema, owing to the impairment of vital capacity which it entails by interfering with the aeration of the blood, and rendering the system more liable to intercurrent diseases and serious complications.

PLEURODYNIA AND INTERCOSTAL NEURALGIA.

Pleurodynia is a rheumatic affection of the intercostal muscles, accompanied by sharp pain, which is increased by the respiratory movements. *Intercostal neuralgia* appears in paroxysms of pain, periodically, which is not increased by movement.

ACCEPTANCE.—Simple and uncomplicated forms of these complaints do not reject, in the absence of physical signs pointing to pulmonary, pleuritic or organic diseases, but all cases should be postponed until the applicant is free from the symptoms.

TUMORS WITHIN THE CHEST.

Intra-thoracic tumors may be steatomatous, fatty, fibrous, cancerous or aneurismal, and are always likely to produce pressure upon the lungs, heart, blood vessels or nerves, causing pain, shortness of breath, palpitation and displacement of organs, bulging of the ribs and sternum diminished reson-

ance and vesicular murmur, deep-seated dullness. The exclusive method of diagnosis should be used to determine the absence of other lesions which might present the same symptoms.

REJECTION is required in all cases, without exception.

DEPOSITS WITHIN THE LUNGS.

These deposits may result from inflammation, tuberculosis, cancer, melanosis, typhoid fever and syphilis.

(1.) Inflammatory deposits in the parenchyma of the lung are detected by the physical signs and by historical and present symptoms. The exudation of acute pneumonia may remain consolidated for a long time, or, in fact, permanently unabsorbed, even after the patient has regained apparent health. Physical signs are some retraction of the chest wall, restricted movement of the ribs in respiration, a dull percussion note, with bronchial respiration and broncophony over the site of deposit, and there may be dyspepsia and exacerbations of fever.

POSTPONEMENT.—The presence of this form of deposit postpones until re-examination demonstrates its disappearance or identifies it with the tuberculous variety, which is determined by the family history, diathesis, cachexia and course of the disease, and which, as a matter of course, rejects. Inflammatory deposit at the apex of the lung is exceedingly apt to undergo tuberculous degeneration.

(2.) Tuberculous deposits must be recognized in their incipiency by the Medical Examiner.

REJECTION.—(Refer to article on consumption in section on "Nutrition and Diathesis," Part III., and article on "Hereditary Transmission," Part III.) (1) Hereditary taint, as described, rejects. (2.) Also a marked diathesis, even without local tuberculous deposits. (3.) Evidences of deposit at the apices of the lungs, which are more liable to infection, owing to the fact that those parts are less used in ordinary respiration. Physical signs should be searched for carefully, particularly in the supra and infra-clavicular and supra-scapular regions, any variation from the normal standard of respiration being considered sufficient ground, at least, for postponement and re-examination.

(3.) Typhoid deposits, yielding the same symptoms and physical signs as tubercle, may, nevertheless, become permanently reabsorbed and the patient regain perfect health.

POSTPONEMENT is in order in all these cases.

(4.) Syphilitic deposits, under appropriate treatment for a term of years, may disappear and leave the patient in good health.

REJECTION is imperative whenever their presence is demonstrated.

(5.) Cancerous deposits absolutely reject.

(6.) Melanoid deposits also reject the applicant.

CANCER OF THE LUNGS.

REJECTION invariable. *Varieties.*—Medullary as a rule; melanotic in rare cases. It is commonly unilateral, or it may be diffused in nodules in both lungs. Primary cancer only affects one lung, but the secondary form usually appears in both lungs. *Causes.*—Hereditary tendency; cancer of the breast in females; previous disease and injuries. The disease is most common in men between forty and sixty years of age. *Symptoms.*—Pain in the chest, cough, currant-juice sputa, hemorrhage, etc.; enlargement or retraction of the affected side, dullness, feeble respiration, bronchial breathing, etc. From consumption it is differentiated by slower progress, less constitutional disturbance, limitation to a single lung, history, presence of the cachexia from chronic pleurisy, which it resembles by the methods of exclusive diagnosis.

SYPHILIS OF THE LUNGS.

REJECTION.—When present, syphilitic deposits in the lungs always reject. They closely resemble tubercles, which often become engrafted upon syphilitic degeneration of lung tissue.

CHRONIC PNEUMONIA.

Synonyms.—Fibrous or interstitial pneumonia; pulmonary cirrhosis.

Definition.—It is the form of pneumonia which is associated with inflammatory deposits or connective tissue growths, which organize and contract.

Causes.—Acute pneumonia, splenization, encapsulated abscess or infarctions. *Symptoms.*—Shortness of breath, pain, cough, with or without sputa, dullness of percussion sound, bronchial respiration, broncophony, increased vocal fremitus and resonance over the affected side, etc.

REJECTION follows in all cases where the deposit is not absorbed and there remains a suspicion of tuberculous taint.

CHRONIC PLEURISY.

Definition.—This is a subacute inflammation, with effusion of a serofibrinous fluid into the pleural cavity. *Causes.*—Primary form, from exposure to cold or dampness, injury. The secondary form may be due to, or follow any of the fevers, rheumatism, Bright's disease, pyæmia, septicæmia, alcoholism, pneumonia, cancer of the lung, phthisis. *Symptoms.*—Sense of fullness in the side or pain, dispnœa on exertion, fever, loss of flesh, anxious countenance, enlargement of the affected side, displacement of the heart, absence of vocal fremitus, flatness below the level of the fluid, absence of respiratory murmur below the level of the fluid and bronchial breathing above; pleuritic friction sounds as absorption takes place and the thickened pleural surfaces rub together during respiration.

REJECTION.—It becomes necessary to reject the applicant suffering from chronic pleurisy, whenever any incurable complication is present, or the disease seems to be progressing towards empyema.

POSTPONEMENT.—Defer all uncomplicated cases until a re-examination shall decide the future eligibility of the candidate. The simple form of inflammation may subside and leave few marks of deterioration, either in the chest or in the constitution.

PLEURITIC ADHESIONS.

POSTPONEMENT and re-examination should be the rule in these cases, in order to determine the absence of any uninsurable organic disease. Simple forms of pleuritic adhesions which do not materially impair the breathing capacity, should not deprive the applicant of the benefits of life insurance, but all cases should be postponed at least one year after the attack.

EMPYEMA.

When pus accumulates in the pleural cavity, the disease is called empyema. Both sides are usually affected, and it generally follows chronic disease of the heart, liver or kidneys, and is associated with dropsy elsewhere.

REJECTION in every case must be the decision.

HYDROTHORAX.

REJECTION.—This term signifies a dropsical accumulation within the pleural cavities, which is caused by organic disease of the heart, liver or kidneys, and coexists with dropsies in other localities. It invariably rejects.

HYDRO-PNEUMOTHORAX.

REJECTION.—This is a condition characterized by the presence of both fluid and air in the pleural cavity and, of course, rejects.

COLLAPSE OF THE LUNGS.

REJECTION.—This disease begins with imperfect expansion of the air cells, which finally become shrunken over a considerable area, refuse to perform their function, and at last constitute the condition called collapse of the lungs. It is caused either by bronchitis or compression. Physical signs are dullness, bronchial breathing and increased vocal fremitus. As it is likely to cause incurable lesions, it always rejects.

HÆMOPTYSIS.

Spitting of blood from the lungs, or hæmoptysis. *Causes.*—(1.) Those situated outside the lungs, with which it may be confounded. It may come from the posterior nares, fauces, mouth, œsophagus or stomach; from diseases of the larynx, trachea and bronchi (such as congestion, inflammation, ulceration, cancer, etc.). (2.) Causes in the lung—Mechanical hyperæmia, from the inhalation of irritants, or too high altitudes. Traumatism, pulmonary congestion, pneumonia, acute or chronic; abscess, gangrene, apoplexy, phthisis, cancer, weak capillaries, aneurism of the pulmonary capillaries, etc. (3.) Mediastinal causes—Tumors pressing on the pulmonary vessels.

(4.) Circulatory causes—Aneurism of the arch of the aorta bursting into a bronchial tube, mitral disease of the heart, hypertrophy of the right ventricle, dilatation of the left ventricle, diseases of the pulmonary vessels, such as aneurism of the pulmonary artery, aneurism of the arteria innominata, or of the carotid or subclavian artery opening into the air passages. (5.) Nervous causes—Vicarious menstruation. (6.) Blood causes—Hemorrhagic diathesis, scurvy, purpura. (7.) Other causes—Violent exercise or overexertion, excessive use of alcoholic stimulants, habitual inhalation of tobacco smoke, such as is practiced by cigarette smokers, gout, rheumatism, blows on the chest, etc.

REJECTION is imperative in every case that presents a clear history of spitting of blood from the lungs, either with or without the concomitance of suspicious symptoms of lung lesions, a history of inherited transmission, or the presence of the diathesis or cachexia.

POSTPONEMENT.—Many companies postpone a case of hæmoptysis for from seven to ten years after the attack, require a physician's certificate at the expiration of that period that there has been no recurrence, and a satisfactory re-examination from their own Medical Examiner, before they will issue any form of insurance policy.

ACCEPTANCE.—If it is incontestably and positively proven by testimony that an alleged hemorrhage came from a harmless local source outside of the lungs, and the medical examination is satisfactory to the Executive Officers, a policy may be issued, but the benefit of any doubt should always be given to the company.

CONSUMPTION.

REJECTION is the invariable rule when the disease is present.

(The reader is referred for the full discussion of this subject to the sections on "Hereditary Influences" and "Nutrition and Diathesis," Part III., and to "Instructions to Medical Examiners," Part I.)

DISEASES OF THE HEART AND BLOOD VESSELS.

(Refer to "Examination of the Heart," Part II., for full data concerning the location of the heart, impulse, rhythm, position of valves, heart sounds and murmurs, observed by means of inspection, palpation, percussion and auscultation.)

We proceed with a brief description of those diseases of the circulatory organs with which the life insurance examiner has to deal.

REJECTION.—Any organic disease of the heart or arteries positively rejects.

ENDOCARDITIS.

Definition.—Endocarditis begins with an acute inflammation of the serous membrane lining the cavities of the heart, which gradually becomes chronic and parenchymatous, resulting in thickening and induration of the

endocardium. Most of the morbid changes are found in that portion of the membrane covering the valves of the left heart and lining the apex of the left ventricle.

Pathology.—Thickening takes place from the increase of connective tissue. Retraction results from fibroid changes in the new connective tissue formations, causing puckering of the valves and giving their edges a cartilaginous consistence. Adhesions occur between the edges of the valves, producing, in some cases, a mere button-hole slit, most common at the mitral and aortic orifices. Degenerations of the valves ensue at a certain stage of the disease, which are either fatty, granular or calcareous, and may end in ulceration, destruction of tissue, rupture of valves and regurgitation. Calcareous degeneration is more frequent at the aortic orifice and takes place late in life. Vegetations of a fibroid character grow upon the valves, which frequently cause sudden and fatal regurgitation, or, becoming separated from their roots, enter the circulation and give rise to embolism or develop infarction in some of the vital organs. All of these abnormal changes are due to the inflammatory process.

Symptoms.—The chief manifestations of endocarditis are found in the alterations of the heart sounds, which indicate the various valvular lesions.

Causes.—Morbid changes in the blood, which irritate and inflame the serous surfaces of the endocardium—urea in the blood during Bright's disease and the blood of rheumatic or syphilitic subjects. It may occur after diphtheria and fevers of all kinds.

REJECTION is the rule in all degrees of endocarditis.

VALVULAR LESIONS.

(1.) Obstructive lesions, caused by thickening of the valves, with slight retraction and adhesions, atheromatous and calcareous degeneration; resulting usually from chronic endocarditis, causing obstruction to the blood current and valvular murmurs.

(2.) Regurgitant lesions or insufficiency of the valves, caused by extensive valvular retraction, perforation, partial detachment of valves, rupture of the chordæ tendineæ, the formation of calcareous plates, which prevent closure of the valves and allow the blood to regurgitate.

(3.) Both of these pathological conditions may coexist, the one being more extensive than the other.

(4.) Valvular lesions of the right heart are rare, because endocarditis on that side seldom occurs. When found they are generally secondary to lesions of the left side of the heart.

REJECTION.—No responsible company will insure these risks.

VALVULAR LESIONS OF THE LEFT HEART.

AORTIC OBSTRUCTION.

Definition.—An abnormal condition of the aortic valves, as before de-

scribed, obstructing the flow of blood from the left ventricle into the aorta, which is always accompanied by hypertrophy of the muscular wall of the left ventricle.

Causes.—Acute or chronic endocarditis; prolonged and severe muscular exercise under adverse conditions; atheromatous degeneration of the aorta. It generally occurs in middle or advanced life. *Symptoms.*—Pulse small, compressible, jerking or intermittent; œdema of the feet from defective return circulation through the veins, etc. Cardiac impulse increased; apex-beat increased and moved to the left; increased area of dullness to the left and downward; a direct murmur, systolic, replacing or following the first sound of the heart, heard with greatest intensity at the base of the heart and propagated along the carotids. *Differential Diagnosis.*—From mitral regurgitant murmur, which is also systolic, but is heard with maximum intensity at the apex, and has its sound carried to the left and behind, also audible at the base. From tricuspid regurgitant, whose greatest intensity is at the apex, but is seldom audible above the third rib and has the sound propagated towards the epigastrium. From an anæmic murmur, with which the pulse is soft, full and compressible, the apex beat feeble, the sound being a venous hum heard over the carotids.

AORTIC REGURGITATION.

Definition.—One of the gravest heart lesions. The semi-lunar valves may be shortened or shrunken by endocarditis preventing closure; or lacerated, dilated or adherent, causing a free opening, allowing regurgitation of blood, dilatation of the left ventricle, and followed by compensatory hypertrophy. Endocarditis is produced, and also distension and degeneration of the arteries, leading often to rupture of the arteries in the brain. Tissue degeneration of the walls of the heart ensues from obstruction to the coronary vessels. Dilatation of the ventricle increases and the mitral valves become insufficient from pressure and extension of disease. Finally there is a disturbance of the venous circulation, resulting in cyanosis and dropsy.

Causes.—Acute or chronic endocarditis, excessive muscular exercise, atheroma of the aorta. *Symptoms.*—Pulse quick, hard, jerking, irregular and intermittent, delayed after the apex-beat of the heart; palpitation of the heart and hypertrophy; dispnœa from pulmonary congestion, etc.; increased area of the apex-beat, carotid pulsation, heaving impulse to the left of the nipple about the eighth rib; area of præcordial dullness to the left and below the normal area, which extends towards the axillary space as dilatation increases; an indirect murmur, diastolic, with or following the second sound of the heart, heard at the base of the heart and down along the sternum to the ensiform cartilage; when combined with aortic obstruction, there is a double murmur heard over a large area. Differential diagnosis rests on the presence of a diastolic murmur and the coexistence of dilatation and hypertrophy of the left ventricle.

MITRAL OBSTRUCTION.

Definition.—It is a condition of stenosis of the auriculo-ventricular orifice of the left heart, caused by constriction at the base of the mitral valves, adhesion of valve-tips and chordæ tendineæ, following rheumatic endocarditis, principally in young children. The mitral opening, which should admit the tips of three fingers, often becomes a mere "button-hole slit." Dilatation and hypertrophy of the left auricle follow from over-distension, also pulmonary congestion from obstruction in the pulmonary veins. "Brown pigmentation or induration" of the lungs and bronchorrhœa are common sequelæ, or pulmonary apoplexy may occur during exercise, and finally pulmonary œdema.

Causes.—Acute or chronic endocarditis in young people, morbid changes in the blood, urea in Bright's disease, rheumatism, any of the fevers. *Symptoms.*—Pulse regular but feeble if stenosis is extensive; dispnœa from pulmonary congestion; dry, hacking nervous cough; or there may be profuse watery expectoration; blood-stained sputa after exercise; feeble cardiac impulse, a distinct purring thrill preceding the apex-beat; area of dullness increased upward and to the left; a presystolic, loud, blubbering murmur heard just before the first sound, with maximum of intensity a little above the apex-beat, usually not transmitted and louder than any other murmur.

Differential diagnosis depends on the purring thrill and loud, blubbering murmur. It may be confused with mitral and aortic regurgitation.

MITRAL REGURGITATION.

Definition.—It is caused by thickening, induration and shortening of the mitral valves, due to endocarditis. The valves may be imbedded with calcareous matter, or torn, the chordæ tendineæ may be ruptured, causing them to flap, or they may become adherent to the ventricular walls.

Secondary changes likely to follow: (1.) Dilatation of the left auricle from over-distension. (2.) Compensatory hypertrophy of left auricle to force the blood through the smaller orifice. (3.) Disturbed pulmonary circulation, causing congestion or brown induration. (4.) Hypertrophy of the right ventricle to overcome pulmonary obstruction. (5.) Dilatation of the right ventricle from too much pressure. (6.) Tricuspid regurgitation, due to excessive dilatation of the ventricle, or to an endocarditis set up in the valves. (7.) Dilatation of the right auricle from the pressure of regurgitated blood. (8.) Compensatory hypertrophy of the right auricle to overcome previous dilatation. (9.) Interference with the return circulation of the venous blood from the superior vena cava, producing headache, vertigo, pulsation in the jugular veins, cyanosis, œdema, apoplexy, etc,; from the inferior vena cava, producing nutmeg liver, obstruction to the portal circulation, hemorrhoids, menstrual disturbance, gastric catarrh, epigastric pulsation, intestinal catarrh, ascites, jaundice, enlarged spleen, passive hyperæmia and catarrhal desquamative nephritis and general anasarca.

(10.) In order to overcome these changes, and sustain the power of the heart, dilatation and hypertrophy of the left ventricle finally occur. *Causes.*—Primary: Acute endocarditis. It may be secondary to aortic valvular disease, or enlargement of the left auriculo-ventricular orifice from excessive dilatation of the left ventricle. *Symptoms.*—Most of the rational symptoms are developed late in the disease from regurgitation at the tricuspid orifice of the right heart. Pulse is feeble, compressible and easily accelerated. Physical signs, increased area of cardiac impulse, apex beat to the left; præcordial dullness, increased laterally and downward; a murmur takes the place of or follows the first sound of the heart, and is synchronous with the systole of the left ventricle; its greatest intensity is at the apex; area of diffusion to the left and backward. *Differential Diagnosis.*—In aortic regurgitation, the pulse is hard and jerky; in aortic obstruction, the murmur is conveyed along the carotids; in tricuspid regurgitation, the murmur is heard over the right ventricle, and to the right of the heart, while in mitral regurgitation the murmur is heard at the apex, and conveyed to the left and backward.

VALVULAR DISEASES OF THE RIGHT HEART.

These are rare, because endocarditis seldom occurs on that side, and, when present, are secondary to valvular lesions of the left heart. Endocarditis of this side is usually confined to the tricuspid valves, and is due to obstruction in the pulmonary circulation from mitral disease, which superinduces hypertrophy of the right ventricle and disease of the valves.

PULMONIC OBSTRUCTION OR STENOSIS.

It is generally due to the pressure of mediastinal tumors upon the pulmonary artery. *Symptoms.*—The murmur is systolic, superficial and distinct, heard with the first sound, its maximum of intensity being at the second left costal cartilage, and the sound is diffused towards the left shoulder.

PULMONIC REGURGITATION.

This pathological lesion is extremely rare, many authorities doubting its existence under any circumstances. Theoretically, the murmur is diastolic, occurring with the second sound, is heard at the base of the heart, the sound being loudest over the valve at the second left costal cartilage. If extensive, this lesion would cause dilatation of the right ventricle, tricuspid regurgitation and disturbance of the systemic circulation.

TRICUSPID REGURGITATION.

It is commonly secondary to mitral obstruction or regurgitation, and preceded by hypertrophy of the right vertricle from the strain of overcoming pulmonic obstruction. The valves thicken and shrink, as do the chordæ tendineæ. There is first dilatation, and, secondly, a compensatory hyper-

trophy of the right auricle; disturbance of the circulation in the venæ cavæ, as described under mitral regurgitation; and, lastly, the left ventricle is hypertrophied in the effort to overcome the systemic obstruction.

Causes.—Its spontaneous origin is doubtful. Pulmonary emphysema causes it by interfering with the pulmonary circulation, throwing abnormal stress on these valves and inciting endocardial inflammation; also, any interference with the pulmonary circulation, such as mitral lesions, mediastinal tumors pressing on the pulmonary artery, etc.

Symptoms.—When the venous return circulation is interfered with, there are many rational symptoms, such as headache, vertigo, cardiac palpitation, dispnœa, cyanosis, etc. Physical signs—increase of visible cardiac impulse, pulsation and distension of the jugular veins; indistinct apex-beat, unless hypertrophy of the left ventricle exists; epigastric pulsation; area of dullness increased to the right of the sternum; a blowing murmur taking the place of the first sound of the heart, systolic, superficial and scarcely heard above the third rib; the maximum of intensity is at the left border of the sternum, between the fourth and sixth ribs, the second sound of the heart being more intense over the pulmonic valves.

Differential Diagnosis.—From mitral regurgitation, aortic obstruction and tricuspid obstruction.

TRICUSPID OBSTRUCTION.

Symptoms.—This murmur, like the mitral obstructive, is presystolic, its greatest intensity being heard along the margin of the fifth and sixth ribs on the left border of the sternum, and its sound is not transmitted far.

CARDIAC ENDOCARDIAL MURMURS.

TABLE OF ORGANIC HEART MURMURS—BY DR. J. DALAND. FROM LEVAN.

ORDER OF FREQUENCY.	When. (Time.)	Where (Place.)	Whither (Direction.)	Direct or Indirect.	Basic or Apexic.	Lesion.
Mitral Regurgitation.	Systolic (with 1st sound).	Above and to left of apex. (Centre of mitral area.)	Along 6th rib to left axilla to lower angle of left scapula.	Indirect.	Apex.	Mitral Insufficiency.
Aortic Obstruction.	Systolic (with 1st sound).	2d right costal cartilage, near sternum or at midsternum.	Toward top of sternum, and along aorta and its branches.	Direct.	Base.	Aortic Stenosis or Constriction.
Aortic Regurgitation.	Diastolic (with 2d sound)	2d right costal cartilage near sternum or at midsternum.	Down along sternum to ensiform cartilage.	Indirect.	Base.	Aortic Insufficiency.
Mitral Obstruction.	Presystolic (before 1st sound).	Over mitral area. (Around apex.)	Usually not transmitted, sometimes to spine of left scapula.	Direct.	Apex.	Mitral Stenosis or Constriction.
Pulmonary Obstruction.	Systolic (with 1st sound).	2d left costal cartilage.	Upward and to left of sternum for short distance, stopping abruptly.	Direct.	Base.	Pulmonary Stenosis or Constriction.
Tricuspid Regurgitation.	Systolic (with 1st sound).	At midsternum, just above ensiform cartilage.	Toward epigastrium.	Indirect.	Apex.	Tricuspid Insufficiency.
Tricuspid Obstruction.	Presystolic (before 2d sound).	Midsternum, opposite cartilage of the 4th rib.	Not transmitted.	Direct.	Apex.	Tricuspid Stenosis or Const'n.
Pulmonary Regurgitation.	Diastolic (with 2d sound).	2d left costal cartilage.	Upward along sternum.	Indirect	Base	Pulmonary Insufficiency.

INORGANIC FUNCTIONAL MURMURS.

ANÆMIC, HÆMIC OR BLOOD MURMURS.—With reference to these arterial functional murmurs, Loomis remarks: "They are soft and blowing in character, almost always systolic and aortic. As regards their area, they are generally diffused, not only over the base of the heart, but along the course of the aorta and vessels of the neck.

"*Differential Diagnosis.*—An anæmic murmur is distinguished from an organic murmur by its blowing character, by always accompanying the first sound of the heart, by being audible in several arteries at the same time, by not being constantly present, and often disappearing when the circulation is tranquil; by the presence of the general symptoms of anæmia and absence of the physical signs of organic heart disease, and by complete disappearance after the cure of anæmia."

VENOUS MURMURS.—(Loomis.) "The so-called 'venous hum' is a continuous humming sound, best heard over the jugular veins, just above the clavicles, when the patient is sitting or standing. It is characteristic of anæmia, and is generally associated with an arterial anæmic murmur."

POSTPONEMENT.—Postpone until both the cause and the murmurs are removed. A re-examination will decide the question of acceptance.

VENTRICULAR MURMURS.

Ventricular Murmurs.—(Loomis.) "Sometimes a murmur is heard during the progress of or after endocarditis, taking the place of or following the first sound of the heart, which is undoubtedly produced within the cavity of the left ventricle, by the roughening of the chordæ tendineæ, or the surface of the valves, or perhaps by an abnormal direction of the current of blood in its passage through. These may be distinguished from other murmurs by the time of their occurrence and their limited area of diffusion, not being heard to the left of the apex or along the aorta."

REJECTION.—These rare bruits also reject.

INDUCED CARDIAC SOUNDS.

Sounds which are neither endocardial, pericardial or functional, the same authority states, may be heard in the precordial region, produced by the movements of the heart upon the lungs. These sounds are mostly systolic and respiratory, ceasing when the breath is held.

POSTPONEMENT.—Postpone and re-examine so as to be sure of the absence of organic murmurs, or of any other uninsurable condition.

PERICARDIAL MURMURS.

Pericardial murmurs or friction sounds, like those of pleurisy, are caused by the rubbing together of the roughened surfaces of the serous membrane lining the pericardium after inflammation of that membrane, and during the movements of the heart. They are rubbing, creaking or rasping sounds

and distinguished from pleuritic friction sounds by being limited to the precordial space and being synchronous with the cardiac, instead of the respiratory movements. These sounds vary in intensity from a slight rustling to a loud rasping, becoming, as a rule, more distinct during expiration than inspiration; when the person sits than when he lies. *Differential Diagnosis.*—From endocardial valvular murmurs they are distinguished by their rubbing quality, superficial character, and by not being transmitted beyond the pericardial area, by their independence of the heart sounds and by their increased intensity when the person is in a sitting position.

PERICARDITIS.

Definition.—Pericarditis signifies inflammation of the serous sack enclosing the heart, and, like pleurisy, passes through the stages of plastic and serous effusion and absorption, generally terminating in recovery unless complicated with Bright's disease or some infectious blood disorder. It is a secondary disease and occurs chiefly in young people. *Causes.*—Extension of inflammation from other diseases, such as pneumonia, pleurisy, necrosis of the sternum and ribs, or from certain blood diseases, as acute rheumatism, Bright's disease of kidneys, scarlet fever, small pox, typhus, tuberculosis, syphilis, alcoholism, scurvy, purpura, etc. *Symptoms.*—The acute stage is never seen in the examining room, but in some cases of chronic pericarditis, the sack may contain some fluid, chalky debris, calcareous plates; or adhesions and roughening of the membrane may remain. *Physical Signs.*—Besides the friction sounds above described, which may be heard, a marked case presents depression of the precordial region from adhesions between the pericardium and the chest walls; indistinct apex-beat, often two inches higher than normal, displaced cardiac impulse and irregular movements of the heart, and increased dullness in the pericardial region.

REJECTION is necessary in all cases showing effusion, or adhesions which restrain free cardiac movements, or when there is a history of repeated attacks.

ACCEPTANCE is admissible only in those cases where there is entire absence of rational and physical signs of the disease, which is an indication of complete recovery.

CARDIAC HYPERTROPHY.

Definition.—Hypertrophy of the heart consists of a thickening of the walls of the heart from an increase chiefly in the number (hyperplasia) of the muscular fibres, involving both the auricles and ventricles. *Varieties.*—*The simple form*, where there is thickening of the walls, without enlargement of the cavities; it is confined to the left ventricle and occurs chiefly in Bright's disease and alcoholism. *The Excentric.*—Where there is thickening of the walls, with enlargement of the cavities. *Concentric.*—Where there is thickening and diminution of the capacity of the cavities, a very

rare variety. *Causes.*—It seldom exists without valvular lesions, arterial changes or capillary obstruction. Aneurism, pericarditis with adhesions; Bright's disease, emphysema, long-continued functional disturbances of the heart, habitual excessive exercise, straining, etc., are some of the assignable causes. In some cases it is congenital. *Symptoms.*—In moderate cases; pulse full and strong, carotid distension and pulsation, face easily flushed, etc. In severe cases; feeling of fullness in the chest, dispnœa, palpitation, headache, vertigo, atheroma and endarteritis of the arteries from extension of the endocarditis, etc. Physical signs—Increased area of pulse, heaving of the chest, bulging of the precordial space and displaced apex-beat, especially in children; increased area of apex-beat, strong epigastric pulsation with hypertrophy of the right ventricle. In hypertrophy of the left ventricle the apex-beat will be three inches below and two or three inches to the left of the nipple. In excentric hypertrophy of the right ventricle, the apex-beat is displaced to the right and downward. Percussion dullness is increased to the right or left, according as the right or left heart is affected. Auscultation gives, in the absence of any murmur, a prolonged dull, muffled first sound, with increased intensity; also increased intensity of the second sound. Left hypertrophy gives the loudest sound over the aortic orifice; right, over the pulmonic orifice. Absence of respiratory murmur over the precordial space.

In hypertrophy with emphysema of the lungs, the apex-beat may not be much increased in force; the heart sounds will be diminished and there may be pulsation in the veins of the neck, due to hypertrophy and dilatation of the right ventricle, with tricuspid regurgitation.

Differential Diagnosis.—In excentric hypertrophy of the left ventricle, there will be a full and strong pulse, carotid pulsation, flushed countenance, apex-beat forcible and diffused to the left and downward, cardiac dullness extending in the same direction, and marked intensity of the second sound of the heart. In the same condition of the right ventricle there will be increased heart's action and dullness to the right and downward, epigastric impulse, and marked intensity of the first sound. In total excentric hypertrophy the same signs will be present as in that of the left heart, with dullness increased in all directions, and intensity of both sounds.

REJECTION is imperative.

CARDIAC DILATATION.

Definition.—There is increase in the capacity of the heart cavities and a diminution of contractile power. *Varieties.*—(1.) Simple form, where there is increase of capacity with no change in the walls of the heart, occurring after fevers and wasting diseases. (2.) Hypertrophic—increased capacity, and thickness of the heart-walls, with diminished contractile power. (3.) Atrophic—marked increase in capacity of the cavities and thinning of the heart-walls. *Frequency.*—It occurs most frequently in the auricles, next in

the right ventricle, and last in the left ventricle. *Causes.*—Cardiac dilatation ensues: (1.) From internal pressure during diastole, from weakness after prolonged sickness, fatty degeneration, and absence of compensatory hypertrophy. (2.) From loss of tone when the heart muscle is the seat of primary fatty degeneration, and after myocarditis. (3.) From degeneration of muscle, which is the seat of excentric hypertrophy, occurring after valvular disease.

Symptoms.—In simple dilatation, when the cavities are increased and the heart's action is labored, there is no increase of force, but the radial pulse is feeble. In atrophic dilatation, the cavities are dilated and the walls thinned, with a feeble and intermittent radial pulse, labored heart's action of feeble power, veins engorged, arteries scantily filled, dispnœa, palpitation, sense of cardiac pulsation, anxious face, livid lips, cyanosis, œdema, etc. Physical signs—Indistinct and increased area of impulse in fat subjects; undulating movement over the precordial space in thin people, prominent jugular veins if the right heart be dilated. Feeble cardiac impulse, apex-beat diffused; purring thrill with the first sound if regurgitation coexists. Increased dullness laterally, but the superficial area of dullness is not increased, as in hypertrophy. When the auricles are dilated the area of dullness is increased upwards; in dilatation of the right auricle the jugular veins are dilated. Auscultation shows the first and second sounds to be short, feeble and nearly equal, and the second is often inaudible except directly over the aortic orifice. Asystolism occurs after exercise. The differential diagnosis is obvious.

REJECTION.—Applicants presenting any degree of dilatation must be refused.

HYPERTROPHY WITH DILATATION.

These conditions often coexist and display characteristic symptoms, according to the preponderance of one or the other.

REJECTION is imperative.

CARDIAC THROMBOSIS.

Definition.—Heart clots may exist for years or be formed in the heart cavities just previous to death. They are of all shapes and vary in size from a pin's head to a walnut, when small being called vegetations, and when large, thrombi. They are found in the cavities or on the valves. *Symptoms.*—When detached they float along and plug up some portion of the arteries, according to their size, producing symptoms referable to their situation. When they remain in the heart they obstruct the current of blood therein, to a greater or less extent, causing irregular cardiac impulse and dullness to the right of the sternum. Auscultation shows marked irregularity of the heart's action, and murmurs indicative of tricuspid or pulmonic obstruction.

REJECTION.—When the condition can be demonstrated, the prognosis is always grave and the candidate must be refused.

CARDIAC ATROPHY.

This condition of the heart, aside from the atrophic form of dilatation or active degeneration, is recognizable by the general cachexia and the physical signs of a weak heart. It is associated with wasting diseases and universally demands rejection.

CARDIAC FATTY DEGENERATION.

Two Varieties.—(1.) Quain's fatty degeneration of the primitive muscular fibres, which lose their nuclei and striated appearance and become granular, etc. (2.) There may simply be an increase of fat in the areolar tissue between the muscular fibres, causing pressure upon them, in which condition the heart is pale, flabby or yellowish, and may be increased in bulk. The first form is a true fatty metamorphosis, due to malnutrition; the second, an adipose condition, due to an excess of fat in the blood. *Predisposing Causes.*—(1.) Malnutrition and obstruction of the coronary arteries. (2.) Excessive or perverted nutrition, causing a deposit of fat. *Exciting Causes.*—Bright's disease of the kidneys, alcoholism, gout, phthisis, cancer, calcification of the coronary arteries, pericardical thickenings, causing compression, poisoning by phosphorus, chloroform, etc., and general obesity. *Symptoms.*—Rational symptoms of weak heart. *Physical Signs.*—Feeble respiration, indistinct apex-beat, rolling motion of the heart, increased area of dullness, first sound feeble or absent, second sound feeble but distinct. Differential diagnosis from cardiac dilatation. It may be recognized by exclusive diagnosis, and the arcus senilis is often present with it. In all cases of rapid obesity, guard against overlooking this disease by a rigid examination.

REJECTION is always demanded.

MYOCARDITIS.

Definition.—Myocarditis is an inflammation of the muscular structure of the heart, associated with two kinds of degeneration and softening. (1.) General or diffused, which is very rare. (2.) Local or circumscribed, met with in pericarditis and endocarditis, usually involving only the external or internal surface of the heart. The left ventricle is most frequently affected, and the process terminates either in connective tissue formation, or in abscess and possible rupture of the heart. Predisposing causes are rheumatism, terminating in connective tissue induration; endocarditis, pericarditis, syphilis, high fever. *Exciting Causes.*—Embolism of the coronary arteries, pyæmia, ending in abscess, septicæmia, typhus and typhoid fevers. *Symptoms.*—Feeble, irregular and intermittent pulse, palpitation, etc. Area of

precordial dullness increased upward and to the left, without heaving im pulse, as in cardiac hypertrophy.

REJECTION invariably the rule.

CARDIAC MALFORMATIONS AND DISPLACEMENTS.

REJECTION follows the detection of any of these anomalies, as indicated by the physical or rational signs, such as congenital malformations or displacements, or those caused by effusions, tumors, aneurism, etc.

NERVOUS CARDIAC PALPITATION.

Definition—Palpitation is often a neurosis of the heart, independent of any organic disease. *Causes.*—Excessive growth, violent exercises, alcoholism, debility, anæmia, sexual excess, typhoid fever, dissipation, late hours, strong tea, coffee, tobacco, shock, fright, dyspepsia, gout, etc.

POSTPONEMENT.—Provided no organic disease exists, the Examiner should postpone these cases, remand them to the care of the family physician, and re-examine at some future time.

ANGINA PECTORIS.

Definition.—Angina is a neurosis, dependent chiefly upon organic heart changes, causing a weak heart. It is especially associated with obstruction in the coronary arteries and fatty degeneration of the heart. Some assert that the cardiac spasm is reflex from some disorder of the pneumogastric or cardiac plexus of nerves. *Predisposing Causes.*—Obstruction to the coronary circulation from aortic regurgitation, or atheroma or embolism of the coronary arteries, fatty degeneration. *Exciting Causes*—Mental emotion, over-exercise, excess in diet or stimulation, bad air, etc.

Symptoms.—Pain, intense, stabbing, shooting through to the back and along the left arm, sense of suffocation, face pale and anxious, livid, covered with cold sweat, pulse faltering and thready, dispnœa, etc., respiration short and hurried, often a heart murmur, if due to valvular lesion, or the signs of fatty degeneration. *Differential Diagnosis.*—From spasmodic asthma by the absence of heart lesions. In hysteria, the pain and rational symptoms are less intense. In intercostal neuralgia, the absence of cardiac disturbance. In neuralgia, the condition of the circulation, location and direction of pain, and the physical signs exclude angina pectoris.

REJECTION.—Rejection is imperative.

BASEDOW'S DISEASE.

Synonyms.—Grave's disease, exophthalmic goitre. This is a disease characterized by palpitation of the heart, accelerated cardiac action, pulsation of the veins of the neck and head, swelling of the thyroid gland, and protrusion of the eye-balls.

Causes.—It is more common among women than men, and may follow

menstrual disorders or anæmia. Protrusion of the eye is caused by a vaso-motor paralysis of the blood vessels, which may affect the heart also, or by the presence of intra-orbital fat, abscess, tumors, or exostosis of the bone. *Symptoms.*—Rapid pulse—120 to 140 per minute—palpitation, blood murmurs, rustling sound in the thyroid gland, which is swollen; cerebral symptoms, etc.

REJECTION.—Rejection is imperative.

DISEASES OF THE ARTERIES.

THORACIC ANEURISM.

Definition.—Aneurism is a local dilatation of an artery, forming a tumor which contains blood. Aneurisms of the thoracic aorta are first described. Diagnosis is best made by the methods of physical examination. *Symptoms—Inspection.*—When the aneurism presses on the superior vena cava, the face, neck and upper extremities are swollen, often livid, with turgid and varicose veins. When the pressure is on the innominate veins, these effects are on the corresponding side. There may be bulging of the chest along the course of the aorta, except when the aneurism is deeply seated. Pulsation of the tumor may be observed, synchronous with the heart's systole. When the tumor is full of fibrin, the pulsation may not be perceptible. Aneurisms of the ascending arch produce bulging to the right of the sternum, near the second costal cartilage; of the transverse arch, protrusion of the upper part of the sternum; of the descending arch, at the left of the sternum. Palpation often yields a pulsation and a thrill. The impulse is usually systolic. Percussion gives dullness over the prominence and auscultation often an audible murmur. *Differential Diagnosis.*—Intra-thoracic solid tumors seldom pulsate, and do not yield a murmur. Aneurism of the arteria-innominata appears on the right of the sternum, protrudes the inner part of the clavicle and the neck. Pressure on the carotid or subclavian artery, suspends the pulsation, which is not thus affected in aneurism of the aorta.

REJECTION.—Aneurism absolutely rejects.

DISEASES OF ARTERIES.

Arteries are subject to morbid changes in their coats. *Varieties.*—Acute and chronic arteritis; the latter, some authorities say, merges into atheroma; periarteritis of the smaller arteries, giving rise to cerebral hemorrhage.

ATHEROMA, or the endarteritis deformans of Virchow, is most common and most serious. It is most frequent in the aorta; then in the cerebral, coronary and splenic arteries and those of the lower extremities. The chief cause is overstraining of the artery. Fatty degeneration and calcification may accompany atheromatous disease, and syphilitic gummatous disease

and albuminoid disease are sometimes found. These diseases tend to the production of apoplexy, aneurism and senile gangrene.

REJECTION is necessary whenever the condition is detected by means of rational or physical signs or in the radial pulse.

SUNSTROKE OR INSOLATION.

(See Diseases of the Nervous System, Part III.)

DISEASES OF THE VEINS.

VARICOSE VEINS.

ACCEPTANCE of applicants with extensive varicose veins is questionable, because they often indicate progressive weakness of the circulation, which may become alarming at any time. They should present unexceptionable claims to insurance in all other respects, and the varicose veins should be very slight. If otherwise decline peremptorily.

HÆMORRHOIDS.

POSTPONEMENT.—When present at the examination, piles, whether hemorrhagic, or of a mild or severe grade, should postpone the case until the applicant is free from the condition and the cause is demonstrated to be merely local and temporary. If the applicant has been operated upon, the attending surgeon's certificate as to the success of the operation should be demanded. If a condition exists at the time of the examination which requires operation, postpone the applicant until the completion of the cure.

THE PULSE IN DISEASE.

POSTPONEMENT—A pulse rate over ninety or under sixty beats to the minute is ground for postponement and re-examination. (See Examination of the Pulse, Part II., and also page 16, Part I.)

DISEASES OF THE ALIMENTARY AND ABDOMINAL ORGANS.

DISEASES OF THE MOUTH, FAUCES AND PHARYNX.

Inspect the condition of the mouth, teeth, gums, tongue, parotid, submaxillary and sublingual glands, fauces, tonsils and pharynx. Any morbid affection of these parts may point to something more serious in the general system. Search for the various forms of stomatitis, ulcerations of all kinds, diseases of the tongue, evidences of acquired or inherited syphilis, salivation, sore throat, tonsillitis, abscesses, pharyngitis, diphtheria, etc. (See Diseases of the Respiratory Organs, Part III.)

THE TONGUE.

A critical examination of the tongue often gives important clinical information, both as regards local disease and morbid processes going on in remote organs. The distinguished Dr. F. T. Roberts of England, sets forth the results of a systematic examination of the tongue, as follows: (1.) Its subjective sensations are the ordinary sense of touch and taste. Dr. Quain reports that a gouty diathesis is sometimes associated with a peculiar sense of heat and burning in the tongue.

(2.) The movements of the tongue are observed during articulation and deglutition. In many cases of cerebral disease one-half of the tongue is paralyzed in its muscles and often becomes furred and very foul. It is specially affected in certain nervous diseases, indicated by difficulty of speaking and swallowing, or complete paralysis. (3.) The objective examination of the tongue reveals all abnormal conditions indicative of functional or organic diseases. Allowance should be made for the effects of certain habits upon its appearance, such as the use of tobacco, stimulants, preparations of iron and other medicines, neglect of brushing the teeth, etc.

(4.) Effect of various diseases on the tongue: In febrile states the tongue is covered with yellowish white fur. In typhoid fever it is small, irritable, furred, or red and glazed; in scarlet fever its papillæ are enlarged and red, giving the strawberry appearance; in diphtheria it often has the characteristic deposit, etc. Constitutional syphilis causes patches or condylomata. A pale, flabby tongue indicates anæmia. An enlarged plethoric, livid, furred tongue is seen in congestions and inflammations of the digestive organs and liver; in obstructed venous circulation or deficient aeration of the blood, from heart and lung affections, or from the pressure of tumors, effusions, abscesses or aneurisms. In local affections of the mouth and throat the tongue is furred; in gastritis it is red, dry, with enlarged papillæ; in chronic dyspepsia of the atonic form it is large, pale and flabby; in chronic diarrhœa or dysentery it is tender, glazed and frequently studded with ulcers; in diabetes mellitus it is clean, red, dry and cracked, also in peritonitis and phthisis. The Examiner should also observe the tongue carefully for indications of any intrinsic disease.

DISEASES OF THE ŒSOPHAGUS.

Diseases of this portion of the alimentary canal are not as common as those of that part below the diaphragm, but they deserve mention, and should be recognized. They comprise inflammation, ulceration, stricture, cancer, paralysis, dilatation and neuroses.

ORGANIC STRICTURE.

Organic stricture of the œsophagus takes place more frequently in the lower third, but may occur in any portion. Above the stricture the canal is dilated, and its walls are thickened, while below, the walls are thinned

and the canal collapsed. *Morbid Anatomy.*—Stricture of this organic nature is due to cicatricial contractions following considerable loss of substance, as in corrosions or ulcerations; to hypertrophy of the muscular and inter-muscular connective tissue; or to chronic catarrh or hypertropy of the submucous tissue.

Causes.—It may be caused by swallowing strong acids, alkalies, or corrosive poisons; by the lodgment of foreign bodies, which set up inflammation; by compression due to swelling of the thyroid gland; by swelling of the lymphatic glands, dislocation of the hyoid bone, exostosis of the vertebræ, abscess, tumors, cancer, aneurism, cancer of the lungs, dilatation of the right subclavian artery, etc. *Symptoms.*—Increasing difficulty in swallowing, especially solid food; pain about the manubrium and back; regurgitation of food, constipation and progressive emaciation. Passage of the œsophageal bougie will settle the diagnosis.

REJECTION of all such cases is the universal rule.

NERVOUS AFFECTIONS.

Globus hystericus is one form of spasmodic stricture of the œsophagus. It is a condition of hyperæsthesia, or increased excitability of the sensory nerves; there is a feeling as though the tube were ligated, with inability to swallow. It occurs principally in nervous people and hysterical women, or as a reflex in pregnancy and uterine diseases.

Hyperkinesis, or dysphagia spastica, is an increased excitability of the motor nerves of the œsophagus. The spasm is reflex and forms a symptom of some diseases of the brain or upper part of the spinal cord. Or it may result from narcotic poisoning, or from alcoholism. It usually comes on during the act of eating.

Akinesis is a diminished excitability of the motor nerves, often accompanying brain or spinal cord disease. When complete paralysis exists, there is no power to swallow food; in incomplete paralysis large pieces of solid food may be swallowed. *Differential Diagnosis.*—From organic stricture these affections may be distinguished by their sudden appearance and disappearance, and the absence of permanent symptoms of pain, dysphagia and obstruction. The use of the bougie will confirm or disprove the diagnosis.

POSTPONEMENT is required in all doubtful cases.

DILATATION.

Total Dilatation of the œsophagus sometimes happens, when the canal may become the size of a person's arm, with thickened or thinned walls. It is due to chronic catarrh, which induces muscular paralysis.

In Partial Dilatation the portion above the stricture is usually largest. Diverticuli (local enlargements, developing into large sacs, formed by for-

eign bodies that have lodged in the walls of the canal) are generally found near the bifurcation of the trachea.

Symptoms of partial dilatation are: first, retention of food, then regurgitation of food mixed with mucus. The diverticuli may be felt as soft tumors in the neck, which may cause dispnœa by compressing the pneumogastric, laryngeal or phrenic nerves.

REJECTION.—Invariably.

THE ABDOMEN.

(For a general view of the alterations in form caused by abdominal diseases, see "Examination of the Abdomen," Part II.)

DISEASES OF THE STOMACH.

GASTRODYNIA.

Definition.—Gastrodynia, or nervous cardialgia, is a painful affection of the stomach not dependent upon any organic change, but upon hyperæsthesia of the pneumogastric nerve, or of the solar plexus of the sympathetic. *Causes.*—Impoverishment of the blood from anæmia or chlorosis, especially in females, uterine and ovarian disorders, cerebral and spinal diseases, disease of, or pressure upon the pneumogastric or sympathetic nerves; dyscrasia, excessive acidity, worms, medicines and beverages of a certain kind. *Symptoms.*—Paroxysms of severe pain, a sense of pressure and griping in the pit of the stomach, faintness, epigastric pulsation, eructation of gases and acrid fluid, etc. *Differential Diagnosis* must be made from ulcer of the stomach, etc.

POSTPONEMENT.—Postpone candidates who present these symptoms. Subsequent re-examination may afford evidence of recovery, or may enable the Examiner to exclude more serious lesions of the stomach.

FUNCTIONAL DYSPEPSIA.

Definition.—Functional or atonic dyspepsia, or indigestion, signifies some derangement of the physiological process of digestion, without any corresponding structural changes in the stomach. It is very frequently brought to the notice of the Examiner, who is expected to recognize it and differentiate it from those forms of dyspepsia which are either the forerunners or the symptoms of organic diseases. He should remember that it may be a harmless symptom of a functional nature, or, on the other hand, a condition which may determine the development of a diathesis or cachexia, such as the tuberculous. Dyspepsia interferes with nutrition, the abeyance of which is likely to leave the system a prey to any inherited taint.

Too much care cannot be used in contrasting many seemingly trivial symptoms with other elements of the examination, so that the applicant's expectation of health may be approximately calculated.

Predisposing Causes.—Any state of depressed vitality predisposes to atonic dyspepsia; heredity, advancing age, anæmia, lack of exercise or fresh air, febrile conditions of the system, neurasthenia, a secretion of gastric juice which is insufficient for digestion or which allows fermentation to take place. *Exciting Causes.*—All causes which produce gastric catarrh, such as excesses in eating and drinking, imperfect mastication and admixture of saliva with the food, a bad diet, alcohol, irregularity in eating, mental worry and physical fatigue; an atonic condition of the muscular layers of the stomach which prevent the movements necessary to the process of digestion, etc. *Symptoms.*—Loss of appetite, morbid cravings, flatulence, nausea, eructations, pyrosis or "water-brash," "heartburn" or a burning sensation in the stomach, headache, constipation, palpitation, and many sympathetic symptoms.

POSTPONEMENT.—Postponement is warranted in all cases in which dyspepsia is present and seems to be undermining the constitution by promoting malnutrition, or rendering the general system liable to the development of organic and transmitted diseases.

ACCEPTANCE.—There are many cases, in which the digestive derangements are obviously temporary, which need not delay the application.

CHRONIC GASTRITIS.

Definition.—Chronic gastric catarrh is of ordinary occurrence. In this condition the blood vessels of the mucous membrane are dilated, and the membrane becomes congested and discolored, and finally thickened. Ridges and furrows form on the inner coating of the stomach, which is covered with a tough layer of gray mucous. Eventually the pyloric orifice of the stomach becomes constricted. *Causes.*—Repeated acute attacks, habitual alcoholic excesses, obstructed circulation in the liver, portal vein, or lungs, heart disease, the tobacco habit, long continued mental depression or excitement, etc. *Symptoms.*—Sense of pressure and fullness in the stomach, especially after eating, swelling of the epigastrium from gas, constant eructations from constriction at the pylorus, indigestion, capricious appetite, water-brash, scanty urine, emaciation, foul tongue, etc. Vomiting occasionally, though rarely, occurs.

REJECTION.—The unmistakable existence of this complaint calls for rejection.

CHRONIC ULCERATION.

Varieties of Ulcers found in the stomach are the acute or perforating, chronic catarrhal, phlegmonous, scrofulous, syphilitic, diphtheritic, cancerous, variolous, and those due to corrosive poisons. The ulcer generally appears on the posterior wall near the pyloric orifice, and has a circular, punched-out appearance. It is from one-fourth to one-half an inch in diameter. *Causes.*—Diseases of the walls of the blood vessels, anæmia and chloro-

sis, catarrh, or long continued pressure in one position, as occurs in certain occupations, such as sewing. *Symptoms.*—Constant epigastric pain, which is aggravated by eating and by pressure over the ulcer. If the pains are increased directly after taking food, the ulcer is located at the upper end of the stomach; if an hour or two after meals, it is near the pylorus. Vomiting, like the pain, indicates the position of the ulcer according as it occurs immediately or some time after taking food. Vomiting of blood is a common symptom from erosion of vessels. The tongue is red and furrowed, and there are increased thirst, chronic constipation, a cachectic look and extreme debility. There is a danger of death from hemorrhage, or from peritonitis following perforation of the ulcer.

REJECTION is imperative.

DILATATION OF THE STOMACH.

Dilatation of the stomach, or gastrectasia, is a condition wherein that viscus is permanently enlarged, its muscular layers being stretched, paralyzed and unable to propel its contents into the intestines in a normal manner. Three factors enter into the proper performance of this mechanical act of emptying the stomach—viz., the muscular force, the quantity and quality of the contents, and the size of the pyloric opening. All cases of gastrectasia depend upon the derangement of one of these factors. Stenosis of the pylorus is sometimes compensated by a corresponding hypertrophy of the muscular walls, increasing the muscular force to the required degree. *Causes.*—Cancer is the most frequent cause of pyloric stenosis; other causes are, the cicatrization of ulcers, hypertrophy of tissue, outside pressure from tumors of neighboring parts, stagnation and fermentation of food within the organ; muscular and chemical insufficiency may also be mentioned as common causes; impairment of the muscular force occasions organic changes in its muscular coats; mechanical restraint, malnutrition and nervous paresis are some of the remaining causes. As a rule, several of them act together to produce the condition. *Frequency.*—It may develop at any age, but is most frequent in middle and advanced life, most of the cases of atonic dilatation beginning between thirty and forty. It occurs oftenest among sedentary subjects, who eat and drink to excess. *Symptoms.*—Owing to the small amount of nourishment actually assimilated, the appetite for both solids and fluids may be greatly increased; there is usually a sense of fullness and dull pain in the region of the stomach; "heartburn" and eructations of gas and acrid fluids are common; vomiting of enormous quantities of ingesta, with or without painful retching; abnormal distention of the abdominal walls; shaking the patient yields a splashing sound. The vomiting of undigested food taken into the stomach a day or two previously is pathognomonic. Without further enumeration of symptoms, it is well for the Examiner to look for this not uncommon affection of the stomach among the

middle-aged, well-to-do applicants, who desire insurance for large amounts, or limited policies.

REJECTION is the invariable rule.

CANCER OF THE STOMACH.

Cancer of the stomach generaly begins in the pyloric region, and spreads transversely, causing annular stricture. The most common forms of cancer in this locality are the scirrhous, medullary and alveolar or colloid, the latter lasting a long time before it produces death. The scirrhous cancer begins in the sub-mucous tissue, as irregular nodules of a whitish color and cartilaginous density, which finally soften into a black pulp and slough away. The medullary variety appears like brain substance, cancer juice exuding from it on section; it spreads more rapidly than the other kinds and may attain the size of the hand. The colloid cancer develops more frequently as a diffuse degeneration, commencing in the sub-mucous tissues; it contains a gelatinous fluid. As a rule it extends to adjacent structures, especially to the lymphatics, pancreas, liver, transverse colon or omentum. It may cause degeneration of the peritoneum and subsequent ascites. Extensive ulceration often causes rupture of the stomach and escape of its contents into the abdominal cavity. *Causes.*—Cancer of the stomach may occur from inherited tendency or may be of primary origin, but it is generally secondary to carcinoma of some other organ. It is more common among men between forty and sixty years of age. *Symptoms.*—Cancerous cachexia, dirty yellow color of the skin, emaciation, a sense of pressure in the epigastrium, anorexia, vomiting, the presence of a nodular tumor in the epigastrium near the navel, and local tenderness, which is increased by pressure and by eating food. Coffee-ground vomiting from capillary hemorrhage is a frequent sympton. This appearance is caused by the action of the gastric juice upon the effused blood.

(See sections on "Hereditary Influences" and "Nutrition and Diathesis, Part III.)

REJECTION in all cases.

HEMATEMESIS.

Hemorrhage from the stomach is often confounded with hemoptysis, or hemorrhages from other sources. It is of much less grave significance than hemorrhage from the lungs, but its causation should always be ascertained, and the prognosis calculated accordingly.

Causes.—Rupture of distended veins (arterial rupture is rare); venous congestion of the gastric mucous membrane from obstruction of the portal circulation of the liver by blood-clots, or from pressure due to cirrhosis of the liver or enlargement of the gall-duct; destruction of the capillaries from yellow atrophy of the liver; rupture of diseased vessels, varices or aneurism; exhaustive fevers, like yellow fever, typhus, scurvy, etc.; im-

proper food, such as an inclusive diet of meat or vegetables; erosion or injury to the walls of the stomach in chronic ulcer or cancer of the stomach; corrosive agents; traumatisms; alcoholism; swallowing of blood in nose-bleed or in hemorrhage from the lungs.

The following table of differential diagnosis is taken from "Pepper's System of Medicine:"

DIFFERENTIAL DIAGNOSIS.

HÆMOPTYSIS.	HÆMATEMESIS.
(1.) Usually preceded by symptoms of pulmonary or cardiac disease. Bronchial hemorrhage, however, without such prodromes is not rare.	(1.) Usually preceded by symptoms of gastric or liver disease, less frequently by other diseases (see causes).
(2.) The attack begins with a tickling sensation in the throat or behind the sternum. The blood is raised by coughing. Vomiting, if it occur at all, follows coughing.	(2.) The attack begins with a feeling of fullness in the stomach, followed by nausea. The blood is expelled by vomiting, to which cough, if it occur, is secondary.
(3.) The blood is bright red, fluid or but slightly coagulated, alkaline, frothy, and often mixed with muco-pus. If the blood has remained some time in the bronchi or a cavity, it becomes dark and coagulated	(3.) The blood is dark, often black and grumous, sometimes acid, and usually mingled with the food. If the blood is vomited at once after its effusion, it is bright red and alkaline, or it may be alkaline if it is effused into an empty stomach.
(4.) The attack is usually accompanied and followed by localized moist râles in the chest, and there may be other physical signs of pulmonary or cardiac disease.	(4) After an attack, the physical examination of the lungs is generally negative, but there are usually signs of gastric or hepatic disease.
Bloody expectoration continues for some time, often for days, after the profuse hemorrhage has ceased.	Black, bloody stools follow profuse hæmatemesis.

REJECTION.—Hæmatemesis rejects, whenever it is clearly caused by cancer, ulceration, cirrhosis of the liver, chronic alcoholism, or any uninsurable disease.

POSTPONEMENT for a certain period is required in all other cases, when a re-examination will settle the question of acceptance or rejection.

DISEASES OF THE INTESTINES AND PERITONEUM.

Acute diseases of these parts seldom come under the observation of the Medical Examiner; but their sequelæ and certain chronic morbid conditions are common, and should be mentioned.

CHRONIC PERITONITIS.

Pathology.—Interstitial thickenings, from one-half to one inch in extent, caused by connective-tissue formations, take place in the peritoneum, and are usually associated with cancer or tubercle. In tuberculous inflammation the omentum may be full of these deposits, over the whole internal and part of the external surface of the peritoneum. The two surfaces may be bound together by adhesions, distending or diminishing the calibre of the gut. The peritoneal cavity may be filled with effusion, or there may be a sero-purulent

exudation with a limited quantity of pus. Oftentimes the peritonitis is local and affects some adjacent organ. If it be in the vicinity of the liver, for example, the capsule of Glisson will be invaded by the disease and hepatitis will ensue; or the inflammation may extend upward from the pelvis, and involve every organ in its course. *Causes.*—Chronic peritonitis is commonly the sequel of an acute attack, which leaves behind a low grade of inflammation that results in those interstitial changes. It may also follow cancerous or tubercular growths or traumatism. *Symptoms.*—Following the acute form the symptoms are not so obscure. There is pain which has lasted for a long time, and is increased by motion or exercise; weakness, emaciation, dyspepsia, enlargement of the mesenteric glands, tumor localized along the course of the intestines, and late in the disease fluid in the peritoneal cavity. Tuberculous symptoms are pain in the abdomen, dyspepsia, diarrhœa alternating with constipation, morning fever and sweats, and functional derangement of any organ which may be involved by extension of the inflammation. The tubercular form is generally secondary to tuberculosis of the lungs, which should, therefore, be carefully examined in all cases.

REJECTION is the only safe procedure, whenever this perplexing condition is suspected.

CHRONIC DIARRHŒA.

Causes.—Chronic intestinal catarrh, or catarrhal enteritis, has many of the same causes as the acute form, which is seldom seen in the examining room. It is the expression of many different pathological conditions and accompanies many general and local diseases. It is common in young children, as well as at a more advanced age, and occurs oftener among men than women. In advancing age it may be due to failing digestion, portal congestion, gouty diathesis, etc. Hereditary influences, bad hygiene—as it occurs among soldiers in camps, in prisons and workhouses, etc.—overwork and anxiety are also causes. It is often the accompaniment of chronic constitutional diseases, such as phthisis, Bright's disease of the kidneys, gout, blood poisoning, scurvy, diabetes, fevers, etc. Diseases of the liver, heart or lungs may produce it by secondary congestion; an unsuitable diet, lodgment of foreign bodies in the intestines, or any chronic intestinal affection, may give rise to chronic diarrhœa.

Pathology.—The changes involve the walls of the intestine, more than in the acute form, the intestinal tube being irregularly dilated and contracted, and its mucous lining altered in color, thickness, etc., according to the portion invaded by the disease. The essential primary feature of chronic catarrh is the increase and persistence of cell-accumulation in the areolar connective tissue of the mucous and sub-mucous layers. Atrophy of the wall of the intestine supervenes upon chronic catarrh in eighty per cent of the cases, its most frequent seat being the cæcum. Lardaceous degeneration of the mucous membrane may also follow. Pneumonia, pleuritis and

cerebritis are frequent complications. *Symptoms.*—When chronic catarrh succeeds the acute form, there is amelioration of the symptoms and apparent recovery for a time.

Any unusual fatigue or excess in eating brings on the diarrhœa again. The stools average from four to eight a day, and consist of fluid, mucus, and semi-solid fæcal matter, being voided early in the day. Constipation may alternate with the diarrhœa. There is emaciation, a dirty gray complexion, debility, a tense abdomen, not sensitive to pressure. The one symptom indicative of atrophy is considered by Nothnagel to be the passage of one soft, unformed stool once a day, which shows that there is no increase of peristaltic action.

REJECTION should be the decision in ninety-nine out of a hundred of these cases. In rare instances postponement for a time may demonstrate complete recovery.

CHRONIC DYSENTERY.

Dysentery, or bloody flux, is an inflammation of the mucous and muscular coats of the large intestines. *Varieties of Dysentery.*—Acute, which is usually epidemic or sporadic; chronic, typhus, bilious, malarial, ulcerative, strumous and tubercular. *Pathology.*—The type of inflammation is usually diphtheritic, the mucous membrane is infiltrated with fibrinous exudation, which brings about malnutrition and sloughing in severe cases.

Causes.—It is supposed to be a specific, infectious, contagious disease, depending upon a germ which has not as yet been demonstrated, most common in hot countries, and among human beings crowded together, as in the case of soldiers. It occurs in the summer and autumn, and may be caused by a certain blood poison, as in purpura, cholera, certain fevers, ague, syphilis, etc. Bad drinking water, impure air, bad hygiene, exposures, etc., are also pregnant causes. The disease is spread from the contagion of the stools, which should always, therefore, be immediately disinfected. *Symptoms.*—It is associated with chronic diarrhœa. The patient suffers from distressing tenesmus; the stools are frequent, semi-fæculent, small, bloody, slimy, offensive and mixed with pus, mucus and cast-off epithelium, and are frequently jelly-like or green in color; alvine discharges, griping pain, emaciation, prostration, etc.

REJECTION.—No candidate subject to chronic or recurring dysentery is eligible for insurance.

INTESTINAL WORMS.

Varieties.—Tænia, or "tape" or "chain-worm," of which there are three varieties, usually found in the small intestine; ascaris lumbricoides, or round worm found in the intestines and stomach; oxyuris, or thread worm found in the rectum; trichocephalus dispar or "whip-worm," found in the large intestine and cæcum. *Symptoms*—Frequently no symptoms appear, but as a rule there are abdominal pains, nausea, vomiting, saliva-

tion, diarrhœa, dilatation of the pupils of the eye, convulsions, intestinal obstruction from the round worms, pruritus ani, and a constant desire to defecate.

POSTPONEMENT.—In case of tape-worm, postpone for six months after the receipt of a certificate from the family physician that the parasite is wholly expelled.

HABITUAL CONSTIPATION.

Constipation is defined as a condition in which there are infrequent or incomplete alvine evacuations, leading to retention of fæces. *Causes.*—Local causes include constriction of some part of the large intestine, collections of scybala or concretions, pressure on the rectum from some tumor, uterine enlargement, hypertrophied prostate, etc., enfeebled muscles of defæcation, atonic condition of the intestinal muscular fibres, pain in the pelvic viscera, paralysing the nerves of the intestine, etc. *General Causes.*—Functional sluggishness, as in the lymphatic temperament, anæmia, amenorrhœa, sedentary habits, mental overwork or worry, abuse of aperients, disregard of regular time for going to stool, abuse of alcohol, tobacco, coffee, tea, or opiates, and errors of diet. Constipation is also a prominent symptom in diseases of the stomach, liver, heart, or nervous system, in diabetes, lead poisoning, etc. It may cause hæmorrhoids, strangury, menstrual disorders, apoplexy, dyspepsia, palpitation, dispnœa, vertigo, headache, etc.

POSTPONEMENT is advised in habitual constipation; in extreme cases dependent on serious disease, rejection.

INTESTINAL COLIC.

Definition.—Intestinal colic or enteralgia is the term used to express all painful affections of the intestinal tract, caused by irritation of the peripheral extremities of the nerves in the intestines, but not coupled with inflammatory or structural changes. *Varieties.*—The most common ones are lead, flatulent, and bilious colic. *Causes.*—In the middle and lower part of the abdomen, from organic disease of the ganglia and plexus of the sympathetic nerves; from mesenteric neuralgia in females; from worms, unripe fruit, undigested food, accumulations of fæces, obstinate constipation; from fright, anger, cold; from affections of adjacent organs, such as a morbid condition of the stomach, liver, kidneys, bladder, testicles, uterus, ovaries, etc., and from an abnormal state of the blood. *Symptoms.*—Pain over the whole abdomen of a tearing, paroxysmal character, jactitations, an anxious and distorted countenance, small and hard pulse, nausea, vomiting, desire to defecate, etc. Pressure on the abdomen gives relief.

ACCEPTANCE is advised in all temporary cases of intestinal colic, except when it is recurrent, and depends on a serious condition, in which case rejection should be the rule

FLATULENT COLIC.

Flatulent colic occurs from the distention of the intestines with gas. *Symptoms.*—Tympanitic abdomen, severe pain, cold sweat, anxious face, nausea, vomiting, etc.

ACCEPTANCE.—This form is usually temporary, and does not debar from insurance.

LEAD COLIC.

Causes.—Lead colic is caused by drinking water impregnated with lead from lead pipes, or by the occupation of painting or mixing colors, the lead poison being absorbed into the system. *Symptoms.*—The attack is usually preceded by the symptoms of lead poisoning. Repeated attacks render the subject more susceptible. Lead poisoning may assume a chronic form, inducing a cachexia, which lasts indefinitely unless the cause is removed, and is expressed by general malnutrition, sallow skin, palsy, impairment of special senses, Bright's disease, epilepsy, imbecility, etc. The pain of the paroxysm is severe, extending to the back and extremities. Other signs of lead poisoning are, a blue line along the gums, bad breath, a sweet taste in mouth, constipation, retraction and hardness of the abdomen.

REJECTION.—Must be imposed, unless the applicant changes his occupation, and shows complete recovery.

HEPATIC COLIC.

Pathology.—Hepatic or bilious colic; the painful passage of gall-stones from the gall-bladder along the duct to the intestine, gives the name to this affection, which is the most serious type of colic. The gall-stones are generally composed of cholesterin and biliverdin, bile pigment and lime phosphate or carbonate. They vary from the size of a pea to that of a hen's egg and may be rough or smooth. Ulceration may be produced and consequent peritonitis, or the walls of the gall-bladder may be thickened, undergo cicatricial contraction and finally cause atrophy of the gall-bladder. Suppurative hepatitis is occasionally produced. *Causes.*—Exciting causes, from foreign bodies in the gall passages around which the concretion is formed; from excess of chalk in the bile, due to drinking hard water which contains too much lime; from lack or decomposition of taurocholic acid; accumulated secretion of bile; excess of cholesterin and coloring matter.

Predisposing Causes.—Advancing age, female sex, sedentary habits, habitual constipation, excess of food or drink, cancer of the liver or stomach, catarrh, etc., of the gall-bladder or ducts, interfering with the escape of bile.

Symptoms.—Begin suddenly and unexpectedly. Pain griping and intense, localized midway between the navel and the border of the ribs on the right side and radiating over the abdomen, shooting towards the right side and through to the back; the patient lies doubled up, pressing the

hands to the abdomen; cool skin, distorted face, vomiting, convulsions, exhaustion; the fæces may be colorless from lack of bile, there is sometimes slight jaundice, etc.

REJECTION—Recurring attacks of biliary colic, even though the intermissions are healthy and the applicant seems to be a fair risk, should reject.

PILES.

(See "Hæmorrhoids," in section on Diseases of Blood Vessels, Part III.)

HERNIA AND FISTULA IN ANO.

(See "Physique," Part II.)

DISEASES OF THE LIVER.

The liver is a most important organ for the consideration of the Life Insurance Examiner, and he should be familiar with all the symptoms which would lead the physician to suspect either functional or organic disease of this gland.

FUNCTIONAL DISORDERS OF THE LIVER.

Dr. Murchison's arrangement of the functional disorders is chosen, because it is succinct and comprehensive. The functions are summarized under three heads:

(1.) The formation of glycogen, which contributes to the maintenance of animal heat and the nutrition of the blood and tissues. (2.) The destructive metamorphosis of albuminoid matters, and the formation of urea and other nitrogenous products, subsequently eliminated by the kidneys, changes which also maintain animal heat. (3.) The secretion of bile, a large portion of which is reabsorbed, assisting in the assimilation of fat and other elements, whilst a part passing into the intestines stimulates peristaltic movements and delays decomposition.

Causes of functional disorders; some of them are secondary to organic disease of the liver, or of the thoracic and abdominal viscera, fevers, malaria, etc. Among the causes of primary disorders, errors of diet and excessive use of alcoholic stimulants are the most important. Other causes are, habitual excess in eating rich and fatty articles of food, such as soups, entrees and pastry, excess of sugar, sweet new wines, liqueurs and malt liquors, neglect of physical exercise, hot climates, bad air, depressing mental and emotional influences, etc.

DISORDERS OF THE GLYCOGENIC FUNCTION.

These come under the head of "Diabetes," which will be described in the next section on the urinary organs.

DISORDERS OF THE METABOLIC FUNCTION.

The views of Dr. Murchison in regard to faulty albuminoid disintegration are here advanced. Disorder in this process results in the non-conversion of albuminoid matter into urea, and the production of lithates and lithic acid, causing that abnormal state of the blood called lithæmia. The worst effects of this lithæmia may be delayed for a time by elimination from the kidneys and bowels. The deposits appear in the urine, especially after excesses in eating and drinking, and in persons of the gouty habit. In due time, when these morbid products fail to be eliminated from the body, their excess in the blood gives rise to various distressing symptoms, such as epigastric oppression, flatulent distention of the stomach and bowels, heartburn, acrid eructations, weakness, drowsiness, catarrh, palpitation, headache, vertigo, ill-temper, hypochondria, etc. Gout is associated with these symptoms. Urinary calculi are often caused by lithæmia, and their treatment should be directed to the relief of the liver disorder. Biliary calculi are also the result of functional disorder of the liver, and are associated with lithæmia and gout. Local inflammations and fevers are promoted by this disorder, as well as some skin diseases, like eczema, psoriasis, lichen and urticaria. Acute and chronic diseases of all kinds are more likely to set in if the blood is thus contaminated.

DISORDERS OF THE BILIARY FUNCTION.

(1.) Excessive secretion of bile is characterized by bilious diarrhœa, copious fluid evacuations, abdominal griping, nausea, vomiting, fever, headache, high colored urine. This condition is generally occasioned by congestion of the liver. (2.) Deficient secretion of bile is marked by the ordinary dyspeptic symptoms—furred tongue, loss of appetite, flatulence, costiveness, pale and offensive stools, sallow or jaundiced skin, dark colored urine, loaded with lithates, etc.

POSTPONEMENT.— These functional disorders of the liver, when primary and present at the time of examination, require postponement; when secondary to organic disease rejection is, of course, necessary.

CONGESTION OF THE LIVER.

Definition.—Congestion, or hyperæmia of the liver, is a uniform enlargement of that organ, caused by over-distention with blood, due either to mechanical obstruction of the return of blood to the heart, or to excessive influx of blood from the portal vessels. It is attended with a sense of fullness and oppression in the epigastric and right hypochondriac regions, a dusky and sometimes jaundiced complexion, and it results, if not relieved, in organic disease of the liver. Causes of active congestion are excesses in eating and drinking, especially in persons of sedentary and indolent habits. There is always a determination of blood to the liver during meals. Sub-tropical

and tropical climates induce this condition unless habits of extreme temperance are observed. A chill may induce active congestion, so also may injuries to the liver, suppressed menses in women, and any of the fevers, especially in hot climates where hepatic diseases are common.

Passive or mechanical congestion or hyperæmia is due to obstruction to the return of blood through the hepatic vein and inferior cava to the heart, as from organic or valvular disease of the right heart, and obstructed circulation in the pulmonary arteries from lung diseases, to diseases of the left heart, or pressure of aneurismal and other tumors upon these passive vessels; weakness of the heart's action tends to induce this blood hepatic congestion. *Symptoms.*—Are characteristic enlargement of the liver, as indicated by the methods of physical diagnosis, tenderness on pressure in acute cases; the enlargement is greatest in passive congestion; a sense of fullness and oppression in the region of the liver, dyspepsia, nausea, vomiting, bilious diarrhœa, sallow skin, and in some cases jaundice; urine high colored and loaded with lithates, etc. Hepatic congestion, common to hot climates, often ends in chronic enlargement and organic disease. The symptoms which mark this form are anæmia, a peculiar cachexia, sallow skin, weak circulation, coldness of the extremities, nervous disturbances, dyspepsia, headache, constipation alternating with diarrhœa, etc.

Added to the symptoms of primary passive congestion of the liver, are those indicating the disease of the heart or lungs, on which it may depend. Ascites is often a late symptom.

POSTPONEMENT.—Scrupulous care is required in determining the import of symptoms pointing to hepatic congestion. If the condition proves to be temporary and unassociated with organic disease, the applicant is eligible for insurance after due probation and a satisfactory re-examination. Reject all doubtful cases and cases of chronic enlargement.

ENLARGEMENTS OF THE LIVER.

The principal hepatic enlargements are associated with the following diseases of the liver: (1.) Congestion or hyperæmia. In chronic cases and in passive congestion from obstructed circulation, the increase of size may be great. (2.) Obstructien of the bile ducts. (3.) Abscess. (4.) Hydatid disease. (5.) Simple hypertrophy, from increase in the number and size of the hepatic cells, causes a painless enlargement, (6.) Fatty degeneration causes moderate painless enlargement. (7.) Albuminoid degenerations often cause great enlargement, second only to that of malignant disease and passive congestion. (8.) Malignant disease finally causes great increase of size. (9.) Cirrhosis, first stage.

CONTRACTION of the liver occurs in cirrhosis, atrophy and often in the first stage of malignant disease.

FATTY DEGENERATION.

Fatty degeneration of the liver is attended with painless enlargement and occurs among persons of indolent and luxurious habits, and in connection with phthisis and other wasting diseases. *Varieties.*—(1.) A deposition of superfluous fat in the liver cells—the fatty liver of Frerichs. (2.) Disturbed nutrition of the liver cells by disease of the parenchyma, which causes retrograde metamorphosis in the cells. *Causes.*—Excessive nourishment and lack of exercise, causing excess of hydrocarbons; excess in the use of stimulants, retarding tissue metamorphosis; tuberculosis of the lungs, preventing the oxidation of hydrocarbons, which become fat; tuberculosis of the bones or intestines; obesity; excess of fat in the blood or the ingestion of too much cod liver oil. *Symptoms.*—Debility, gastric and intestinal catarrh, diarrhœa, etc. *Physical Signs.*—Fullness of the abdomen, absence of ascites and enlarged surface veins; painless, smooth, soft enlargement, with thick edges, etc.

REJECTION.—When this condition is diagnosed the applicant must be rejected.

AMYLOID DEGENERATION.

Amyloid, lardaceous or waxy degeneration of the liver is due to the deposit of this cellulose substance within the liver cells and in the walls of the hepatic vessels. *Causes.*—It occurs in advanced cachexia from scrofulous, syphilitic and wasting diseases; from mercurialism, caries of bone, tedious suppurative processes, tuberculosis, malaria. Similar degeneration of the spleen and kidneys usually coexists.

Symptoms.—There is a painless enlargement of the organ greater than that of fatty liver; the surface is smooth; ascites is present in some cases, due to cachexia and portal obstructions; the skin is pale.

REJECTION is imperative.

CANCER OF THE LIVER.

Cancer of the liver is generally of the medullary variety. It may be circumscribed, or diffused among the liver cells, with no line of demarkation. *Pathology.*—In the circumscribed variety the tumor is rounded and lobulated. The tumors are either solitary or innumerable, from the size of a cocoanut to that of a pea, giving a rough, nodulated feeling to the surface of the organ. When the medullary cancer softens, there is danger of general peritonitis or hemorrhage.

In the diffuse variety, or infiltrated cancer, the liver becomes a white cancerous mass, atrophy and fatty degeneration of the liver cells take place, leading to obliteration of the blood vessels and gall ducts. Alveolar or gelatinous cancer may extend to the parenchyma of the liver from other organs, and transform it into a shapeless mass.

Causes.—It is generally due to a cancerous diathesis, occurs principally

in males, and is usually preceded by cancer of some other organ. *Symptoms.*—Cachexia, dyspepsia, emaciation, tumor, pain on pressure, and distention of the superficial abdominal veins from portal obstruction; the liver is indurated and nodulated, ascites is generally present late in the disease, etc.

REJECTION.—Insurance is impossible.

HYDATIDS OF THE LIVER.

These formations most frequently occur in the right lobe of the liver, and may reach the size of a child's head. *Pathology.*—The capsule of the tumor is adherent to the adjacent tissue and is firm, fibrous and yellowish-white in color. Within the capsule is the cystic layer of the mother cell, which contains a strong saline fluid full of thousands of daughter cells. *Causes.*—From ecchinococci entering the hepatic lymphatics, blood vessels or bile ducts, and there developing. *Symptoms.*—Sense of fullness and pressure, a lobulated and usually large tumor. Jaundice, ascites, enlarged spleen, gastric and intestinal hemorrhage may occur.

REJECTION without exception.

CIRRHOSIS OF THE LIVER.

Cirrhosis or interstitial hepatitis is characterized by an excessive connective-tissue development. It is also called granular, hobnailed or gin-drinkers' liver. *Pathology.—First Stage*, depending on hyperæmia and connective-tissue cell-proliferation. The liver is uniformly enlarged, firm, tough, smooth, and with rounded edges. *Second Stage.*—The cell growth is organized into new connective tissue. The liver is smaller, the surface is puckered and the edges are sharp. *Third Stage*—The new connective tissue contracts and produces atrophy of the liver tissue from degeneration caused by pressure on the blood-vessels. The organ is still smaller, the surface feels as though studded with hobnails, and the edges are sharp. *Causes.*—Alcohol, taken on an empty stomach, which passes directly into the blood and to the liver, causing irritation of tissue and new cell-growth; syphilis, inherited tendency to cancer, gout, etc.

Symptoms.—First Stage.—Sense of fullness and pressure, pain on pressure, liver increased in size and smooth, portal obstruction, etc. *Second Stage.*—Liver decreased in size, firm and hobnailed, diminished area of dullness; enlarged spleen, etc. *Later Stages.*—Ascites, enlarged abdomen, œdema of the legs, etc.

REJECTION invariably the rule.

JAUNDICE.

Varieties.—Hepatogenous, in which there is obstruction to the bile-ducts. Hematogenous, or non-obstructive, when alteration occurs in the blood-pigments, staining the tissues like absorbed bile. *Causes.—Hepatogenous obstructive variety*, affecting the common bile-duct: Congenital defect

in the duct, extension of catarrhal inflammation from the intestine, calculus in the duct, foreign bodies, worms, stricture of duct, pressure from without by tumors or enlarged lymphatics. Affecting the radicals of the bile-ducts: Cancer, hydatids, abscess, cirrhosis, gummata, tubercle, hyperæmia, inflammation of the capsule of the liver. *Hæmatogenous Variety.*—Blood poisons, malaria, poisoning by antimony or phosphorus, snake-bites, pyæmia, septicæmia, anæsthetics; hypersecretion of bile, acute yellow atrophy, fevers, pneumonia and mental emotions; it may be secondary to the hepatogenous variety.

Symptoms.—Hepatogenous Variety.—Liver and gall bladder enlarged, urine colored brown, then green; fæces colorless, skin jaundiced, emaciation, itching, etc. *Hæmatogenous* jaundice is marked by nervous disturbances, irregular and intermittent cardiac and pulse-beats, the urine and fæces are more normal in color, but the urine contains albumen.

POSTPONEMENT is required until a sufficient interval has elapsed after all symptoms have disappeared.

ASCITES.

Ascites, or dropsy of the peritoneum, is an accumulation of serous fluid from non-inflammatory causes. It is usually due to changes which have taken place in the liver, heart, lungs, kidneys or peritoneum, or to changes in the blood. *Causes.*—In the liver: Pressure of abdominal tumors on the portal veins, atrophy, cirrhosis causing pressure on the portal vein, cancer, waxy liver, enlarged lymphatic glands in the transverse fissure, hydatids, abscess, tubercle, gummata and portal thrombosis. In the heart: Tricuspid regurgitation. In the lungs: Emphysema, cancer, pleuritic effusion, and mediastinal tumors, causing insufficiency of the tricuspid valve. In the kidneys: Chronic Bright's disease, producing general hydræmia. In the peritoneum: Cancer, tubercle and chronic inflammation. Blood causes: Anæmia, hydræmia, chlorosis, purpura and scurvy.

Symptoms.—Feeling of abdominal fullness, dispnœa, œdema of the legs and ankles, constipation, scanty urine, etc.

Physical Signs.—On inspection, distention of the abdomen. On percussion, when the patient is lying down, tympanitic resonance on top from the intestines which float on the fluid, dullness below the level of the fluid. Auscultation and shaking give the percussion sound.

REJECTION.—Ascites debars from insurance.

DISEASES OF THE SPLEEN.

These diseases are seldom seen by the Examiner; they comprise acute inflammation, hypertrophy, leucocythæmia, lymphadenoma, or Hodgkin's disease, lardaceous or albuminoid disease, cancer, hydatids, tubercle, syphilis, etc. Excessive enlargement of the spleen is associated with malaria and diseases of other organs, and these should be sought for whenever physical diagnosis demonstrates its presence.

REJECTION.—Whenever dependent on or associated with organic diseases. And the same may be said in regard to diseases of the pancreas when detected.

DISEASES OF THE GENITO-URINARY ORGANS.

Acute diseases of these organs are seldom seen among applicants for insurance, but their sequelæ and the chronic forms are so common among all classes of people, that it is obviously the duty of the Examiner to detect them whenever present. We take the liberty, therefore, of refreshing his memory by stating the leading facts concerning the most important of these affections.

Increasing knowledge and experience enables the physician intuitively to recognize many ultimately fatal diseases in their intermediate stages, by the appearance of the applicant, which the scientific diagnosis confirms.

EXAMINATION OF THE URINE.

The chemical and microscopical examination of the urine is considered in the last chapter of Part II.

DISEASES OF THE KIDNEYS.

RENAL ENLARGEMENTS.

Location of the Kidneys.—The kidneys are situated in the lumbar regions, and occupy the space opposite the two lower dorsal and two upper lumbar vertebræ, the right one extending down a little lower than the left, the upper border of each lying just behind the last rib. They may be either diminished or enlarged in disease, the latter condition being alone recognizable by physical diagnosis. Enlargement of the kidneys is caused by nephritic calculi, hydro-nephrosis, pyelitis, cancerous, tuberculous and other growths, hydatid cysts, or distention from an obstructed ureter, and it sometimes occurs in Addison's disease of the supra-renal capsules.

Diagnosis.—Palpation, by using both hands, one in front and one behind, and pressing firmly, reveals the enlargement.

Percussion.—Place the patient lying down on the chest and abdomen, which posture allows the intestines to float upon the fluid accumulations within the abdomen and surround the kidneys, giving forth a tympanitic percussion note in contrast with the dullness of the kidneys. In this way the extent of the enlargement is determined; but enlargements of the right kidney are often mistaken for tumors of the right lobe of the liver, cancer of the pyloric orifice of the stomach, fæcal distention of the colon, tumor of the right ovary, or ascites. In like manner enlargements of the left kidney have been confounded with tumors of the spleen, or of the left

ovary, and with fæcal distention of the descending colon and ascites. Physical diagnosis is therefore to be depended on only when it is corroborated by the rational symptoms presented.

REJECTION follows the discovery of any renal enlargement, regardless of cause.

HYDRO-NEPHROSIS.

Definition.—Hydro-nephrosis, dropsy of the kidney, or renal dilatation, is a non-inflammatory condition, due to the collection of urine within the pelvis and infundibula of the kidney, from obstruction of the ureter. This dilatation converts the kidney into a sort of pouch, compressing the glandular substance of the organ, and often dilating some portion of the ureter. The renal substance gradually shrinks, and the kidney may become a multilocular cyst as large as a child's head; the ureters may attain the size of the small intestine, with thickened and convoluted walls. The contents of the cyst are watery urine containing salts, blood, pus, epithelium and albumen. *Causes.*—From the pressure of an external tumor; from closure by calculi or mucus, or by inflammation and adhesion of the walls; from stricture of the ureters, or dilatation, etc. *Symptoms.*—A slowly developing, painless, fluctuating tumor in the lumbar region. Sometimes the obstruction suddenly gives way and a large quantity of fluid is discharged from the bladder. These cysts have tough walls and seldom rupture, although containing gallons of fluid in rare cases. *Differential Diagnosis.*—From ovarian cysts, ascites, hydatids and pyelitis. Between hydro-nephrosis and ovarian cysts: In the former the tympanitic colon lies in front of the enlargement, while behind in the lumbar region all tympanitic percussion resonance is absent. Between hydro-nephrosis and ascites: In the former there is no evidence of portal obstruction, and the line of percussion dullness does not change when the patient shifts his position, the reverse of which is true in ascites. Between hydro-nephrosis and hydatids: The discovery of hydatids in the urine will alone differentiate the conditions. Between hydro-nephrosis and pyelitis: In the former there is absence of pus in the urine, and the constitutional symptoms are milder.

REJECTION is always demanded in these cases.

PYELITIS.

Pyelitis, or pyo-nephrosis (as it is called when the ureter is obstructed), is an inflammation, acute or chronic in its course, of the mucous membrane lining the pelvis and calices of the kidney. In the acute variety a mucopurulent secretion covers the mucous surfaces, and the epithelial cells are destroyed in some places. In the chronic form there is dilatation, and pus forms and passes off in the urine, unless the ureter is obstructed, when it accumulates in the kidney and constitutes pyo-nephrosis. Compression from

the pent-up pus destroys the glandular substance of the kidney and often causes rupture. In case only one kidney is affected, the other one does double duty. *Causes.*—Calculi or foreign bodies in the kidney; irritation from decomposition of abnormal urine in the pelvis of the kidney; urethral stricture or enlarged prostate, by causing retention of urine in the bladder, cystitis, and extension of the inflammation along the ureters to the kidney; the walls of the ureters then become thickened and the urine is obstructed in its egress, decomposes and sets up suppurative inflammation in both the kidney and bladder. Other causes are, blood-poisoning, acute parenchymatous nephritis with hæmaturia, overdoses of turpentine or cantharides, etc.; it may complicate other diseases or result from exposure to cold or dampness. *Symptoms.*—Acute pyelitis: Lumbar pain, shooting down the course of the ureters and aggravated by change of position or by micturition; the urine is acid and contains mucus, blood and epithelial cells from the pelvis of the kidney, its specific gravity is 1.026 or more; it often contains albumen, and soon becomes ammoniacal. Chronic pyelitis: Lumbar tumor, deep-seated fluctuation, tenderness on pressure, and dullness on percussion, associated with cystitis, pus in the urine, etc. In pyo-nephrosis the tumor is larger, and large quantities of pus may be evacuated in the urine.

In peri-nephritic abscess, which is a suppuration of the connective tissue surrounding the kidney, the cause is usually traumatic, urinary symptoms are negative, a tumor may point externally, the temperature is lower, and the pus is easily aspirated just below the last rib.

REJECTION.—Diagnosis of any of these conditions precludes the possibility of insurance.

DIABETES INSIPIDUS.

Diabetes insipidus, polyuria, or diuresis, is the term applied to the persistent discharge of large quantities of clear urine, containing neither albumen nor sugar, and of a low specific gravity. It is accompanied by great thirst. *Pathology.*—Renal congestion or atrophy is usually present in this obscure complaint, which is supposed to be caused by dilatation of the renal capillary vessels from disturbance of the ganglionic nerve supply. It may be congenital. In its duration it may vary from a few weeks to years.

Causes.—Shock, blows on the head, cerebral disease or tumors, disease of the solar plexus or great splanchnic nerves, mental excitement, hysteria, insolation, tobacco, intemperance, exposure to cold, drinking cold fluids when over-heated, etc. *Symptoms.*—Usually comes on suddenly; frequent micturition, quantity of urine increased often from five to forty pints in twenty-four hours, intense thirst, dry skin, great emaciation and debility. It is often incurable when dependent on organic nervous disease.

REJECTION is the safest rule.

DIABETES MELLITUS.

Diabetes mellitus, glycosuria or mellituria, is the name applied to a group of complex symptoms, the most conspicuous of which is an excess of saccharine urine. The disease is associated with derangement of the glycogenic function of the liver, with alterations in the nervous system and pancreas, while in other cases no structural changes can be discovered. *Pathology.*—Glycosuria can be produced artificially by puncturing or irritating the so-called diabetic area of the floor of the fourth ventricle in the medulla. This area corresponds with the vaso-motor centre and the roots of the pneumogastric, which is the sensory nerve concerned in glycogenesis. Section of nervous tissue, or any agency which paralyzes the vaso-motor nerves presiding over the tonic contraction of the hepatic blood vessels, is capable of producing glycosuria.

The cause may operate upon the central ganglia, whence the nerves emanate, such as the vicinity of the medulla oblongata and upper part of the spinal cord, or upon the cœliac ganglia and their branches, including those to the pancreas. Or the irritation may be peripheral, and its effects reflex. Any irritation involving the peripheral distribution of the pneumogastric may, therefore, produce it; and such peripheral irritation may take its origin in the stomach, intestines, liver or any organ to which the pneumogastric is distributed. Finally, there is no reason why an inhibitory reflex action should not originate in the sympathetic itself.

Pathologists have found structural changes in the nerve centres of the brain, meningitis, apoplectic effusions and tumors, or hyaline thickening of the cerebral blood vessels; pancreatic disease is said to be present in one-half the cases of diabetes; the liver is frequently congested, enlarged and otherwise diseased; the kidneys are often hyperæmic and enlarged. Atrophy of the testicles and pulmonary phthisis are found not infrequently as secondary effections.

Causes.—A majority of the cases of diabetes cannot be accounted for. The disease is most common between the ages of thirty and sixty, and in the male sex. It may be due to shock, emotion, mental anxiety, overwork, injury or disease of the nervous system, or excesses in eating and drinking; to heredity, malarial and continued fevers, gout, rheumatism, catching cold, sexual excesses, etc. *Symptoms.*—Frequent and excessive urination, incessant thirst and dryness of the mouth, general malaise, dryness and itching of the skin and end of the penis or at the vulva, absence of perspiration, nervous disorders, ill-temper, feeling of fatigue and drowsiness, disordered vision, loss of flesh, anæmia, headache, vertigo, skin eruptions, boils or carbuncles, dyspepsia, irregular appetite, palpitation of the heart, failure of mental and sexual powers, the presence of sugar in the urine, etc. (See Examination of the Urine, Part II. Sugar.) The specific gravity of the urine will generally be over 1.025.

REJECTION.—Rejection should be the invariable rule. Many cases of

incipient diabetes escape the scrutiny of the Medical Examiner and obtain insurance, which would not occur if the urinary and personal examinations of the applicant were made more searching, and every doubtful case postponed until it was decided whether or not the disease existed.

HÆMATURIA.

Blood in the urine is indicated by a smoky or red appearance, varying in hue according to the percentage of blood. The microscopical appearance of the red corpuscles will confirm the diagnosis. It may come from the kidneys, bladder, urethra, or from the uterus and vagina in females.

Blood from the kidney is evenly mixed with the urine and is rarely clotted. Symptoms of kidney disease coexist, the pain is in the lumbar region, and kidney epithelium is present in the urine. The causes of renal hæmaturia are the intense active hyperæmias which occur in scarlatina, typhus and malarial fevers, injuries, wounds, cancer, renal calculi, purpura, scurvy, heart diseases producing passive obstructive congestion, and infarctions due to renal embolisms or capillary thrombosis.

Blood from the Bladder.—Clotted blood escapes during the close of the act of urination: bladder symptoms are present. Causes of cystic hæmaturia are cystitis, stone in the bladder, tumors of the bladder, gout, etc.

Blood from the urethra is passed at the beginning of urination, and urethral causes exist.

REJECTION.—Unless the hæmaturia is ascribable to some unimportant cause, it is sufficient ground for rejection.

URÆMIA.

Uræmia signifies the presence of urea in the blood current, resulting from any disease or disorder which prevents either the secretion or discharge of the urine, and is the general term used to designate manifold nervous symptoms caused by this blood-poison. *Causes.*—The complete or partial arrest of urinary secretion; retention in the blood of all the nitrogenous, effete matters usually eliminated by the kidneys; excess in the circulation of urea, which is a peculiarly irritant poison to the cerebro-spinal centres, interfering with the functions of organic life. It is common in all forms of Bright's disease of the kidneys in cystic, tubercular and cancerous renal diseases; in suppurative nephritis, and in all cases of obstructive or non-obstructive anuria. But uræmia may be absent in any of these conditions, a fact that renders the connection between cause and effect somewhat obscure.

The attack of uræmia is often precipitated by pregnancy, parturition, alcoholism, menstruation, or intercurrent diseases, which, nevertheless, do not always suffice to induce it. *Pathology.*—Two theories are advanced to explain the exact nature of the uræmic process—the mechanical and the

chemical. The mechanical explanation refers the cause to a sudden increase of blood pressure, or of the proportion of water in the blood, inducing cerebral œdema from this increased pressure; but many cases of uræmia show no encephalic œdema. One of the earliest chemical theories explained the symptoms by the retention in the circulation of urea; and the latest ones impute them to the retention of certain other excrementitious matters in the blood.

Symptoms of Acute Uræmia.—In all the varieties of uræmia the symptoms are sudden in their onset. *The Comatose Form.*—After headache, giddiness, affections of sight, vomiting and delirious excitement, coma is rapidly developed; or it may supervene without such premonitory symptoms; the face is pale, the pupils react slowly to light, firm pressure on the supra-orbital notch does not disclose consciousness, there is a peculiar stertor, unlike the deep snoring of apoplectic coma; and death may supervene, or convalescence, only to be followed by a recurrence. Acute uræmic coma is most common in the inflammatory and cirrhotic forms of Bright's disease. *The convulsive form* simulates an epileptic seizure, or may be unattended by loss of consciousness; it may affect certain groups of muscles and simulate tetanus; the attacks may be single or there may be six or more during twelve hours; they may be recovered from, or may prove rapidly fatal. The convulsive type is common to all forms of Bright's disease, but most frequently occurs with the inflammatory and cirrhotic varieties, the latter being frequently ushered in with convuisions as the first symptom.

Other types of uræmia are the delirious, in which a restless delirium replaces other symptoms; the mixed, in which coma and convulsions coexist; the dispnœic, in which there is sudden loss of breath, without corresponding physical signs in the lungs or heart; and the articular, a rare form, resembling rheumatism. Differential diagnosis of acute uræmic coma from hemiplegia with loss of consciousness may be made by the absence of paralysis of one side, the character of the breathing, and by the urinary analysis; of the convulsive type from epilepsy, by the absence of the initial cry, corpse-like pallor, one-sided convulsions, and turning in of the thumbs on the palms of the hands, and by the preservation of reflex irritability which is lost in true epilepsy; by the invariable presence of albumen in the urine. From opium poisoning by the equal contraction of the pupils and by the results of an examination of the urine. From belladonna poisoning, by the condition of the pupils and the urine. In hysterical convulsions the patient falls with a cry into a tetanic or cataleptic condition, the limbs jerk irregularly, the breathing is spasmodic and choking, there is no lividity of the countenance, and the pupils, pulse and temperature are normal. Examination of the urine settles the diagnosis.

Symptoms of Chronic Uræmia.—This comes on gradually, and attracts so little attention, that it may sometimes be first observed in the examining

room of a life insurance company. And in view of that contingency the Medical Examiner should be familiar with the subject of uræmia in all its phases. At first there are constantly recurring periods of listlessness, drowsiness, headache, insomnia, peculiar pallor of the face, slowness of movements and speech, dimness of sight, and ringing in the ears; later are observed œdema under the eyes, then of the ankles extending upward, and general anasarca; there is more or less torpor, the patient talks indistinctly when aroused, the lethargy deepens into coma with muttering delirium, convulsions, subsultus tendinum, and twitching of the facial muscles, then follow œdema of the lungs, serous inflammations of the endocardium and meninges of the brain if death delays. This is a common mode of termination of chronic Bright's disease. There is, of course, albumin in the urine.

REJECTION.—Rejection is imperative.

ALBUMINURIA.

Albuminuria is a condition characterized by the presence of albumin in the urine. Other albuminous matters, not true albumins, may be present in hæmatinuria, hæmaturia, pyuria, spermatorrhœa, etc.

For tests, see Chemical Examination of the Urine, Part II., Albumin.

Causes.—Blood changes, such as occur in periodical and eruptive fevers, puerperal fever, diphtheria, gout, rheumatism, etc.; obstructions in the renal circulation, from pneumonia, emphysema, valvular disease of the heart, weak heart, kidney disease, a gravid uterus, abdominal tumors, etc.; certain poisons, as alcohol, lead, mercury, iodide of potassium, cantharides, arsenic, chlorate of potash, etc. Abstinence from salt or a sole diet of eggs is said to produce albuminuria.

Pathology.—There are two kinds of albuminuria: (1.) True albuminuria, in which serum-albumin appears in the urine; (2.) false albuminuria, in which some other albuminous body is found there. True albuminuria is caused by some change in either the circulation or structure of the kidney, for serum-albumin is not excreted by the healthy kidney. There are two kinds of alteration in renal circulation which produces albuminuria: (*a.*) Increased pressure of blood in the renal arteries; (*b.*) increased pressure in the renal veins, which is the more common cause. Venous congestion of the kidney is produced by obstruction to the flow of the venous blood from the pressure of a tumor, or of the pregnant uterus, upon the renal veins or upon the vena cava; from disease of the liver obstructing the vena cava; or from disease of the heart or lungs, such as tricuspid or mitral regurgitation, or chronic bronchitis and emphysema. Temporary albuminuria, observed after cold bathing, etc., is due to venous congestion, and the albuminuria associated with nervous diseases is probably caused in the same way, rather than by direct nervous action upon the kidney itself. In false albuminuria the albuminous bodies pass through the kidney without there being any alteration either in the circulation or in the structure. These

albuminous bodies are hæmaglobin, egg albumin and Bence Jones' albumin. Hæmoglobin appears whenever blood is present in the urine; egg albumin, when some portion of it fails to be digested in the alimentary canal and is absorbed unchanged and excreted by the kidneys. Bence Jones' albumin is very rare, and is found in the urine of persons suffering from osteo-malacia. It is almost identical with hemialbuminose, which is one of the products of imperfect digestion, when these bodies do not undergo the regular transformation in the liver and alimentary canal. *Symptoms.*—Albumin may be present in the urine without exciting any symptoms whatever, but its continuous loss leads to anæmia and certain changes in the circulation, which result in the following symptoms: A pasty complexion, dry skin and tendency to œdema of the cellular tissue, especially under the eyes and along the shins; derangements of digestion, flatulence, nausea, irregularity of the bowels; nervous disorders shown by muscular weakness, lassitude, pains and headache; frequent micturition, palpitation of the heart, etc.

REJECTION.—It must be decided by repeated examination that albumin is a constant factor, for the continued presence of albumin in the urine is sufficient cause for rejection, without the coexistence of any other symptoms. Some companies postpone these cases for a term, according to the individual case.

RENAL CONGESTION.

Renal congestion or hyperæmia is of two kinds—active, and passive or mechanical. (1.) Active congestion enlarges the kidneys. *Causes.*—Exposure to sudden changes of temperature; blood poisons, such as scarlatina, diphtheria, typhus and malarial fevers; irritation of the passages from cantharides, turpentine, nitre, copaiba, etc. It may result from diabetes, cholæmia, new growths, traumatism, or cardiac hypertrophy from too forcible action of the heart.

Passive or mechanical congestion, especially when associated with chronic heart disease, hardens, but does not necessarily enlarge, the kidneys. *Causes.*—Mechanical obstruction to the circulation of any kind, from outside pressure upon the veins, from heart and lung diseases, etc. *Symptoms.*—Decrease in the quantity of urine, increase in its specific gravity, the presence of albumin and traces of blood.

REJECTION.—Chronic renal congestion, or the tendency to it, is a cause for rejection of the applicant.

BRIGHT'S DISEASE OF THE KIDNEYS.

These forms of nephritis, first described by Dr. Bright, are frequently brought to the notice of the Examiner, especially in some of their insidious stages, when the victim may not be conscious of any danger. The Medical Examiner should therefore be conversant with all the manifestations of

renal disease, and scrutinize the applicant showing any tendency thereto with extra care.

These diseases develop most frequently between the ages of thirty and fifty, and men are more subject to them than women.

Pathological varieties of Bright's diseases:

(1.) Parenchymatous nephritis, inflammatory in nature and beginning in the uriniferous tubules.

(2.) Amyloid degeneration, non-inflammatory, and beginning in the walls of the blood vessels.

(3.) Cirrhosis, a peculiar chronic inflammation beginning in the intertubular tissue of the kidney.

General symptoms which show the tendency to these various forms of nephritis or mark their progress:

A peculiar harshness and dryness of the skin; pallor of the countenance; weakness; lack of energy; œdema under the eyes or in the lower extremities; headache, blurred vision, spots before the eyes, noises in the ears; the ophthalmoscope may show minute, white exudations on the retina of the eye; dyspepsia, nausea or vomiting, irregular action of the bowels; symptoms of liver disease, of heart disease, such as hypertrophy or valvular lesions, of consumptive taint, of former pneumonia, pleurisy or myocarditis, of chronic bronchitis or rheumatism, or of former syphilis; evidences of intemperance or of high living.

Does the applicant's occupation expose him to sudden changes of temperature and dampness? Is the climate damp, changeable and along the sea shore? These are questions which the Examiner should propose to himself in weighing the probability of a tendency to Bright's disease.

Examination of the Urine.—Scanty or excessive amount of urine; albuminuria, temporary or persistent; deficiency of urea; low specific gravity; casts in the urine, etc.

REJECTION.—Rejection is imperative.

PARENCHYMATOUS NEPHRITIS.

This is the most common form of Bright's disease, is inflammatory in character, begins in the uriniferous tubules, is of short or long duration, acute or chronic, and has three stages:

FIRST STAGE.—Of active, catarrhal, croupous or desquamative inflammation of the uriniferous tubules; called "acute, desquamative or parenchymatous nephritis." There is more or less intense congestion, with very active proliferation and desquamation of the epithelium lining the tubules, causing them to become distended and plugged up.

SECOND STAGE.—Degeneration of the cortical substance, either fatty or granular, called the "fatty" or "large, white kidney." The excessive engorgement of the first stage may cause rupture of the capillary vessels and allow the blood corpuscles to escape into the tubes, wherein fibrin is effused

from the obstructed circulation; this coagulates in the tubes, and mixes with the epithelial cells and blood-corpuscles, forming hyaline material. Next the contents of the tubules and the epithelial cells become the seat of fatty degeneration, the nuclei of the cells disappear, and the tubules are distended with broken-down epithelial cells and fat.

THIRD STAGE.—Atrophy of the kidney. After the fatty degeneration of the second stage, cellular elements are developed in the walls of the tubules and intertubular tissue. Organization and contraction of this new connective-tissue occurs, compressing the blood-vessels, and atrophy of the kidney substance follows. The kidneys are smaller than normal, hard, uneven and nodular. The tubules become dilated unevenly and form cysts. The capsule is thickened and adherent, etc.

Causes.—The predisposing causes of parenchymatous nephritis are as follows: Exposure to sudden changes, alcoholism, sitting in a draught, irritation of the tubules by excess of excrementitious matter to be eliminated by the kidneys while the bowels and skin are inactive, reflex influence of the nervous system causing inflammation, reflex influence of the sympathetic nervous system, renal hyperæmia, and inflammation of other organs.

The exciting causes are blood-poisoning in fevers, scarlatina, typhus, diphtheria, measles, pyæmia, rheumatism; direct irritation of the tubules from copaiba, etc.; mechanical obstruction to the renal circulation in pregnancy, heart and lung diseases; senile decay, pneumonia, and extension of inflammation from adjacent organs.

Symptoms.—For those of the acute form of this disease, see Uræmia, in the preceding pages. In the chronic form which commences with the acute stage, the following symptoms are developed: General anasarca, waxy countenance, œdema of the feet, hypertrophy of the heart, pulmonary œdema, and increased secretion of urine. If the uræmic symptoms subside, the patient passes into the third stage of renal atrophy and becomes a confirmed invalid.

THE URINE.—In the first stage of parenchymatous nephritis, the urine is scanty and high-colored, of high specific gravity (1.030), and contains albumin fifty per cent, epithelial, small hyaline and blood casts and blood corpuscles.

In the second stage the urine is more abundant, not so high colored, of low specific gravity (1.005), and contains albumin about one-third, and fatty casts, with oil globules, in addition to those of the first stage.

In the third stage of atrophy, the urine is pale and greatly increased in amount, specific gravity about 1.010, albumin slight in amount, if any; casts, fine granular and large hyaline.

REJECTION.—In all cases rejection is absolute.

AMYLOID KIDNEY.

Amyloid, waxy, lardaceous or albuminoid degeneration of the kidney, is a non-inflammatory condition and begins as a deposit of amyloid material

in the walls of the blood-vessels of the kidney. This disease is always chronic in its course and generally invades several organs at once. There are three stages. *First Stage.*—Amyloid degeneration of the walls of the blood-vessels; the kidney is slightly increased in size and harder than normal; the capsule is not adherent; on section Lugol's solution of iodine changes the amyloid material to a dark brown color. *Second Stage.*—Changes in the blood-vessels and uriniferous tubules; the kidney is very much increased in size, the capsule is adherent and the surface is pale and smooth. Increase of size is due to increased development of the cortical substance, etc. *Third Stage.*—Atrophy of the kidney; the capsule is adherent, the surface is uneven, pale and waxy; the diminution of size is due to decrease of both medullary and cortical substances.

Causes.—Tertiary syphilis, prolonged suppuration, especially in diseases of bone, caries or necrosis, suppurative diseases of the lungs, empyema and phthisis.

Symptoms.—Headache, convulsions and coma are rare; chronic ascites or œdema seldom develops; the progress of the disease is very slow; there are general emaciation, a peculiar cachectic appearance, waxy complexion, impairment of the mental faculties, dispnœa on exertion, dyspepsia, nausea, and œdema of the feet at night; the patient rises two or three times at night to urinate; the perspiration has a urinous odor, the urine is greatly increased in quantity, and there are diarrhœa and marked thirst; the spleen is enlarged, from the same cause that produces the waxy kidney, as is also the liver, which has smooth, sharp edges.

THE URINE.—Always increased in quantity from forty to one hundred ounces in the twenty-four hours, very light color, low specific gravity (1.005). *Albumin.*—Usually only a trace, but if large in quantity, it shows that tubular inflammation is set up within the amyloid kidney. *Casts.*—Large hyaline, or granular, or both, not abundant; when epithelial or fatty casts appear, it indicates inflammation of the tubules.

REJECTION is invariably the rule.

CIRRHOTIC KIDNEY.

Synonyms.—Renal sclerosis; contracted, small, granular, gouty, "gin-drinkers" and "hob-nailed" kidney, are some of the synonyms of chronic interstitial nephritis.

Definition.—It is due to an increase in the intertubular structures and atrophy of all the other tissues. It has three stages: *First Stage.*—Enlargement, due to an increase of the intertubular tissue, from connective tissue cell-growth. *Second Stage.*—Organization of this new tissue. *Third Stage.*—Atrophy, due to contraction of the new tissue, producing degeneration from pressure on the blood-vessels. The disease develops slowly and insidiously and usually appears between the ages of forty and sixty.

Causes.—Most common are gout and rheumatism, producing it by the

action of their peculiar blood poisons; lead poisoning, cancerous diathesis, malaria, mental strain and syphilis; alcoholism may produce cirrhosis both of the liver and of the kidneys.

Symptoms.—The early symptoms are generally obscure; these are frequent micturition, anæmic appearance, weakness and dyspepsia; ascites may not occur until late in the disease, or from cirrhosis of the liver; there are slight œdema of the lower limbs, especially after walking through the day, excessive quantity of urine, and great thirst. *Nervous Symptoms.*—These are marked headache, if associated with gout or rheumatism, vertigo, temporary inability to speak, insomnia, deafness, numbness, cramps, neuralgia, chorea and paralysis are among the more common; uræmic symptons, convulsions and coma are more common in this than in any other form of Bright's disease, and are usually developed after some mental or physical exertion, etc.

THE URINE.—Greatly increased in quantity, and of low specific gravity (1.010). Albumn is sometimes, but not always, present; the casts are few and difficult to find, and are usually of the large hyaline variety.

Complications.—Cardiac hypertrophy of the left ventricle is almost always present from obstruction, arterial tension is high, and there is atheroma of the walls of the arteries. Mucous inflammations, especially chronic bronchitis, alternating with renal and gouty symptoms; uræmic neuro-retinitis of one eye and then the other; hemorrhages from mucous and serous surfaces, especially cerebral apoplexy, from degeneration of the cerebral arteries and the increased force of a hypertrophied left ventricle, are other complications often met with.

REJECTION is peremptory; and it is necessary for the Examiner to exercise the greatest caution to prevent the acceptance of many applicants suffering from chronic interstitial nephritis in the developing stage.

RENAL TUBERCULOSIS.

Tuberculosis of the kidney is a rare disease, and is usually secondary to tubercular disease of some other organ, particularly of the lungs. It generally occurs between the ages of twenty and forty. Its site, in the majority of cases, is the left kidney, and the symptoms are enlargement of the kidney, pain in the lumbar region, and frequent micturition. The urine is albuminous, and contains blood, epithelium and eventually miliary tubercles.

REJECTION.—Rejection should be the invariable rule.

RENAL CANCER.

Cancer of the kidney is of rare occurrence; it may be primary, or secondary to carcinoma of other organs. The deposits are of the medullary type, and appear as circumscribed nodules in the cortical substance. The

cancerous tumor may become enormously large, and the disease is often associated with cancer of the testicle. *Symptoms.*—Gradual emaciation, lumbar pain, cachectic countenance, an irregular and immobile tumor in the lumbar region, and enlarged superficial veins; the urine is unchanged, or there may be albuminuria with hæmaturia.

REJECTION.—The disease is rapidly fatal, and rejection is imperative.

NEW RENAL GROWTHS.

Cancer, miliary tuberculosis, tumors of the intertubular structure, syphilitic gummata, fibroma in the pyramids, lipoma of the capsule, pelvis or cortical substance.

REJECTION.—They will reject when diagnosed.

RENAL CALCULI.

Renal calculi form in the uriniferous tubules of the pyramids, in the pelvis of the kidneys, or in the cortical substance, and occur at any age.

Pathology.—In advanced life the formation of calculi is associated with a gouty diathesis and lithæmia, and deposits of the urate of soda are found, as described in a previous section; calculi of carbonate and phosphate of lime form also during certain bone diseases. They produce cysts or are washed down, and lodge in the pelvis of the kidney. They may obstruct the ureters and excite pyelitis, renal abscess, hydro and pyo-nephrosis, or parenchymatous nephritis. The nucleus of the calculus may be blood, epithelium, grains of pigment, or pus.

Varieties.—Uric acid in children and young people; in adult life, lime and the triple phosphates.

Symptoms.—The symptoms are generally pain in the lumbar region, and those of renal colic, aggravated by any form of exercise that jolts the body, which continue until the calculus passes out with the urine, ceases to irritate or becomes encysted.

POSTPONEMENT.—One company postpones a case until five years have elapsed after the passage of a urinary calculus. The length of postponement should depend on the hereditary predisposition and diathesis.

REJECTION.—In all cases where the condition is recurrent or incurable.

RENAL COLIC.

Renal colic, or nephralgia, is caused by the passage of a calculus from the kidney along the ureters to the bladder. *Symptoms.*—The onset is sudden; there is intense pain in the affected region, radiating downward to the bladder, testicles, end of the penis and thighs; the patient shrinks and writhes with pain, there is violent and painful vomiting; the countenance is anxious, pale and moist, pulse small, extremities cold. The urine

may be suppressed or scanty, high colored or bloody, and often causes pain when it is voided.

REJECTION.—Recurrent attacks of renal colic reject.

POSTPONEMENT.—An applicant should be postponed at least two years after the last attack.

ADDISON'S DISEASE OF THE SUPRA RENAL CAPSULES.

REJECTION.—It causes the characteristic peculiar bronzing of the skin, and rejects the applicant.

BLADDER AND GENERATIVE ORGANS.

CHRONIC CYSTITIS.

Causes.—It generally results from retained urine due to the urethral obstruction of permanent stricture or enlarged prostrate gland, or to some obstacle to the free egress of urine, like vesical calculi, growths in the bladder, paralysis, atony and over-distension; from disease of a nerve centre; from disease of adjacent organs; certain affections of the kidney, and from altered urine, lithæmia, catarrh, etc. *Symptoms.*—Dull pain and a sense of fullness in the hypogastric region, frequent and painful micturition. The urine is cloudy, and contains mucus, blood, pus and phosphates.

REJECTION.—Its presence rejects absolutely.

STONE IN THE BLADDER.

Urinary calculi vary in size from sand-like grains to stones the size of a small orange.

Symptoms.—Severe paroxysms of pain in the bladder, perineum and glans penis, aggravated by exercise; frequent micturition, sometimes incontinence of urine, and a feeling that the bladder cannot be emptied. The urine, often thick with soapy mucus, may contain blood and pus, and the act of urination may be suddenly stopped by pressure of the stone against the neck of the bladder. Tenesmus and prolapse of the rectum are common. Discovery of the stone with the exploring urethral sound will confirm the diagnosis.

POSTPONEMENT.—Its presence rejects during continuance and convalescence, but unless the hereditary predisposition and diathesis are strongly marked, the passage of a small calculus does not affect life insurance permanently. One company postpones for five years after the passage of a urinary calculus.

PROSTATITIS AND ENLARGED PROSTATE.

REJECTION.—If sufficient to retard the extrusion of urine, rejection is absolute, and all cases should be postponed until it is certain that the condition is merely temporary.

SPERMATORRHŒA.

ACCEPTANCE.—Occasional spermatorrhœa and nocturnal emissions need not reject, unless associated with serious constitutional or local disease.

MASTURBATION.

The Medical Examiner should be quick to detect impairment of the constitution and physique from this common habit, as well as from sexual excess, and report the facts to the home office—even if the case be otherwise acceptable.

GONORRHŒA.

In applicants who have had gonorrhœa, examine carefully for permanent stricture of the urethra and symptoms of gonorrhœal rheumatism. If any evil effects remain they should be taken into account in rendering an opinion. Stricture either postpones or rejects according to the gravity of the case. Gonorrhœal rheumatism postpones for two or more years after the last attack. If it is of the recurrent variety it absolutely rejects.

URETHRAL STRICTURE.

POSTPONEMENT.—Postpone all of these cases, whether spasmodic or organic, until the condition is relieved and all secondary symptoms have disappeared.

Urinary fistula must also be cured before acceptance.

CHANCROIDS AND BUBOES.

POSTPONEMENT.—Postpone, until they and the conditions upon which they depend, are entirely cured.

SYPHILITIC CHANCRE.

REJECTION.—See Syphilis.

GENERAL HEALTH RECORD.

(See "Instructions to Medical Examiners," Part I.)

PREVIOUS SERIOUS ILLNESS.

Some companies propound the question—"Has the applicant had any serious illness, injury, deformity or amputation during the past seven years?" The most recent diseases the applicant has suffered from should be recorded first, then those more remote, and the Examiner should note whether any previous illness has served to develop any inherited tendency to disease, or deteriorated the functional or organic health of any organ.

MECHANICAL OR SURGICAL INJURY.

The effects of any accident, injury or surgical operation upon the person of the applicant should be thoroughly investigated. Ascertain if malignant or tuberculous disease, caries or necrosis, etc., were either the causes or complications of any surgical operation; and notice whether there are signs of exhausted vitality.

AMPUTATIONS.

In many instances the amputation of important members and capital operations greatly lessen the insurability of a candidate, by impairing the original constitution of the individual and his power of resisting future disease. One company in cases of amputation above the knee charges one-half per cent extra premium.

DEFORMITIES.

Malformations and deformities, congenital or acquired, should be cause for rejection when of sufficient extent to impair locomotion or when they present an objectionable or unsighty appearance. The Examiner should write a description of the condition, and incorporate it with his report of the examination, so that the executive officers can decide intelligently, for it often happens that an applicant may be perfectly insurable in all other respects and yet present some unfortunate malformation, which would debar him from insurance, because in some companies it is not considered advisable to insure risks who are noticeably deformed.

NEGROES AND HALF-BREEDS.

One company charges one-half per cent extra premium rates to negroes, pure or mixed blood, residing outside of the tropics, but most companies prefer not to insure them at all.

PREVIOUS INSURANCE OR REJECTION.

Previous insurance of a candidate in another or the same company must not tempt the Examiner to relax his vigilance. In the lapse of time since a previous acceptance the personal habits of the applicant, the development of some hereditary tendency or constitutional disease, or some serious illness or accident, may change the condition of the risk, and prevent insurance. Previous rejection should incite to double vigilance.

FAMILY HISTORY.

(See "Hereditary Influences," Part I. and Part III.)

PHYSICAL CONDITION.

(See "Examination of the Applicant," Part II.)

SMALL-POX.

Small-pox or varioloid, if completely recovered from, is rather a recommendation than an obstacle to insurance. But the Examiner must bear in mind the complications common to that disease, which are inflammations of the serous membranes, especially pleurisy, pericarditis, pneumonia, bronchitis, consumption, uræmia, nervous affections and bone diseases, and judge from his examination whether there are any sequelæ present in any of those organs which may be prejudicial to the risk.

VACCINATION.

See "Physique," Part II. In most companies lack of successful vaccination requires a special contract that death from small-pox is not insured against, and it is therefore necessary that the fact of a vaccination be elicited.

SCARLET FEVER.

Previous history of scarlet fever, fully recovered from, is also said to indirectly improve the risk. In this case the Examiner should be equally careful in his search for injurious after-effects. The ordinary complications of a case of scarlet fever are consecutively—nephritis, bronchitis, pneumonia, inflammations of serous membranes, ulcerative endocarditis, rheumatism, suppurative inflammation of joints, diphtheria, suppuration of the middle ear, uræmia, anasarca. Hence one must look well to the kidneys, urine, middle-ear, throat, heart and general diathesis, before recommending the risk.

YELLOW FEVER.

If the applicant has had yellow fever and suffers no evil effects it is a recommendation, especially if he resides in the belt where it is endemic. It is a miasmatic, infectious, contagious disease, and occurs between forty degrees North and twenty degrees South latitude, generally as an epidemic in crowded cities or towns along the sea coast.

(See "Climate," Part II.)

PERSONAL HABITS.

(See "Instructions to Medical Examiners," Part I.)

Where the personal examination seems to be negative as regards the determination of life-expectation, reliable data concerning the candidate's personal habits may decide as to the insurability of the risk, and a competent observer can judge approximately whether the applicant is confirmed in habits of physical health.

INTEMPERANCE.

(See "Life Insurance Formalities," "Instructions to Medical Examiners," Part I., and "Hereditary Influences," and "Diathesis," Part III.)

THE OPIUM HABIT.

The peculiar cachexia of this habit is unmistakable. It is the absence of animal health, the counterfeit of premature old age—wasted muscles, shriveled, colorless skin, clammy with perspiration, with the characteristic odor of opium, the averted look, contracted pupils, nervous irritability, mental and physical lassitude, etc.

REJECTION.—Actual presence of this chronic habit, as corroborated by the evidence of the family physician, or of an intimate friend, always rejects.

OTHER NERVOUS STIMULANTS.

REJECTION.—The habitual indulgence in other narcotics and nervous stimulants, tending to destroy functional and organic health and shorten life, when proven as above, is sufficient ground for rejection.

Some of the agents used are chloroform, ether, Hoffman s anodyne, cannabis indica, chloral, the bromides, cocaine, etc. Tobacco, coffee, tea, etc., indulged in to excess, should be classed under the same head and cause postponement.

MEDICAL ADVISER.

The name and address of the applicant's regular family physician or last medical attendant should be written down by the Examiner when it is required by the company for whom he is examining.

FEMALE INSURANCE.

GENERAL CONSIDERATIONS.

The general suggestions considered heretofore relating to the physical and personal examination of the applicant, as well as to the diseases affecting life insurance, apply with equal force in the case of a woman; but we have now to notice the subject of the reproductive organs, as a conclusion of this part of the work.

Although some companies decline to write female risks owing to the prospective dangers of the child-bearing period, it is only fair to state that the female life expectation is about three years more than the male, from which statistical data we may safely conclude that the peculiar hazards of this epoch are more than counterbalanced by the increased hardships and exposure of the male sex.

In order to overcome this prejudice, the examination of the genito-urinary organs should be searching, and placed in contrast with the general constitution and personal health of the female applicant.

Most companies charge one-half per cent extra premium for all female risks, prior to the age of forty-eight.

The differences in anatomical configuration and physique have been alluded to in the section on "Physique," Part II.

PRIMIPARÆ.

Among primiparæ the rate of mortality considerably exceeds that of multiparæ up to the ninth labor, after which the consequent risk increases with each succeeding parturition. Primary gestation is more liable to the complications of difficult labor, post-partum hemorrhage, puerperal fever, convulsions and mania, mammary diseases, miscarriages, etc.

POSTPONEMENT.— When the applicant is pregnant for the first time, the application must be postponed until she is fully recovered from the effects of parturition.

MULTIPARÆ.

ACCEPTANCE.—Women who have borne children in normal labors, without instrumental interference and show no injurious after-effects, may be insured.

POSTPONEMENT—Postpone all cases of pregnancy; all instances where the mother seems, in the judgment of the Examiner, to have been bearing children too fast; and all cases with a history of instrumental labors, malpresentations, etc.

CHANGE OF LIFE.

POSTPONEMENT.—There are peculiar dangers connected with the climacteric period during the cessation of the function of menstruation, when transmitted tendencies are likely to appear suddenly. It is safest to postpone such applicants until the crisis is fully passed, unless the candidate is an exceptionally good risk in all other respects, and enjoys perfect general health.

UTERINE DISEASES.

REJECTION.—All organic diseases and tumors of the uterus or ovaries, recurring hemorrhages, etc., when present, positively reject.

CONDITIONS THAT REJECT.

A history of repeated miscarriages, malpresentations from deformed pelvis or other causes, instrumental labors, post-partum hemorrhage, puerperal diseases, uræmia, etc.; the presence of organic mammary diseases or tumors; emaciation and exhaustion during lactation, etc. A history and

cachexia that denote liability to the development of inherited taints. See "Hereditary Influences," Part III.

Dropsical effusions, phlagmasia dolens, remarkable varicosity of the veins, etc.

CONDITIONS THAT POSTPONE.

Chronic metritis or endometritis, subinvolution of the uterus, prolapsus, chronic uterine displacements, vesico-vaginal and other fistulæ, severe lacerations, menstrual disorders, profuse leucorrhœal and other discharges, all reflex disturbances, etc., should postpone until completely cured.

MENSTRUATION.

Critical inquiry should be made with reference to the past and present performance of the menstrual functions. Has any reported irregularity or imperfection in this respect impaired the general health? Is it a family characteristic, etc.

BIBLIOGRAPHY.

The principal books used in the preparation of this volume are:

"The Medical Adviser in Life Insurance," - - - *Sieveking.*
"Medical Examinations for Life Insurance," - - - - *Allen.*
"Medical Examination for Life Insurance," - - - - *Levan.*
"Walshe on the Heart," - - - - - - -
"Walshe on the Lungs," - - - - - - -
"Physical Diagnosis," - - - *Delafield and Stillman.*
"Physical Diagnosis," - - - - - - *Loomis.*
"Medical Diagnosis," - - - - - - *Da Costa.*
"Manual of the Practice of Medicine," - - - - - *Moir.*
"Dictionary of Medicine," - - - - - *Quain.*
"System of Medicine," - - - - - - *Pepper.*
"System of Medicine," - - - *Reynolds.*
"System of Surgery," - - - - *Holmes.*
"Encyclopedia of Medicine," - *Ziemssen.*
"Mortuary Statistics," - *Various Insurance Companies.*
"The Medical Examiner in Life Insurance," - - - *Taylor.*
etc., etc.

APPENDIX.

I.—LEGAL QUESTIONS AS TO THE OFFICE AND EVIDENCE OF THE MEDICAL EXAMINER.

IT is a matter of interest, as well as of importance, to the Medical Examiner to understand his legal relations to the applicant and to the insurance companies. Through the courtesy of Mr. John M. Taylor, Vice-President of the Connecticut Mutual Life Insurance Company, we are enabled to present an abstract of a pamphlet written by him on this subject, and for fuller information we refer our readers to the pamphlet itself.

History of Life Insurance.

In the year 1610, at Florence, Italy, Giovanni Battista insured the life of Sir Knight Brother Ferdinand for the sum of 3000 scudi, the term extending from the August Festival at Piacenza of that year to the Feast of the Epiphany in 1611, the premium being three and three-fourths per cent of the amount underwritten. The policy was written in quaint mediæval Latin. At that time the Italians were accustomed to call an insurance policy a lottery ticket. But the Italian mind, with its love of speculation and chance, never kept pace with the practical ingenuity of the Anglo-Saxon.

This old Florentine policy nearly marks the limit of historic acquaintance with life insurance as a monetary transaction. The policy is "incontestable" and "indisputable" in every legal sense which can attach to such a contract. It is agreed that in the event of the death of Sir Knight Brother, the assurers shall not be able to say, offer or accept anything, unless after full payment. It covers natural or accidental death. It grants free residence and travel anywhere in the world, by land or water. It has no time limit as to its "indisputable" qualities. It is good at issue. It requires no proof of interest in the life insured. It waives in terms all statutes in this behalf, and the claim is payable three days after notice of death. The policy was a pure "gamble" by Batista. But the chief interest in the policy, in this connection, is the fact that it was probably written with no reference to a physician, or his opinion. It is a curious fact that the first life underwriters reckoned their chance of loss, their real hazard,

on death by accident, and excluded death from natural causes. Until the companies themselves, with capital at risk, found by experience that they could not insure all classes, conditions and ages of men for long periods at a given premium, and remain solvent, reference of the risk to a physician was seldom made, and it was at a relatively late date that a medical examination became a common requirement in life underwriting. In the rapid growth of our American life companies all genuine reform in this important matter has come of experience. The companies have followed the courts in their decisions, and in no respect, perhaps, has development been so slow as in the gradual advance of the medical officer to his present station of responsibility and honor.

TYPICAL AGREEMENTS

IMPOSED BY LIFE INSURANCE COMPANIES.

The following typical provisions in the printed application for insurance and medical examination of certain companies mark the limits of the recently attempted changes in the Examiner's responsibilities, and invite discussion of his real relation to the company and to the insurance contract, and of his testimony with some of its limitations :

"It is hereby agreed: that all the foregoing statements and answers, as well as those made or to be made, to the society's Medical Examiner, are warranted to be true, and are offered to the society as a consideration of the contract."

"Does the candidate expressly waive all provisions of law forbidding any physician who has attended him from disclosing all information which he thereby acquired?"

"I also agree that all the foregoing statements and answers, as well as those that I make, or shall make to the company's Medical Examiner in continuation of this application, are by me warranted to be true, and are offered to the company as a consideration of the contract."

"Has any answer given by you to any question in this application been made, modified or influenced by any explanation or advice of the Medical Examiner, or any other person?"

"I hereby declare and warrant—That I hereby waive all personal or statutory rights which I may have to object to the testimony of any physician or surgeon, whether consulted by me or not, so far as he may have professional or expert knowledge of the facts or information sought for by the interrogatories in this application."

FORMER PRECEDENTS.

The former relations of Examiners, as set down in law reports and the institutional writers of England and America, may be summarized as follows :

(1.) The person whose life is insured, the Examiner and the private referees were regarded, to a certain extent, as the agents of the insured party.

(2.) In making replies the referees are the agents of the party proposing the insurance, and their statements are representations made on his behalf, and form part of the contract.

(3.) The friend's report and that of the medical referee are regarded in law as statements of the assured party.

(4.) If it be proved that the referees knowingly gave false testimonials, the policy shall be void.

(5.) The medical referee is the agent, in respect to his replies, of the proposer, and the latter is responsible for any want of candor or neglect by him.

(6.) If the fee were paid to the medical referee by the company, the question would arise whether he had not become the agent of the insurers, instead of the applicant.

See Bunyon's Law of Life Insurance; Crawley's Life Insurance; Bliss on Life Insurance; May on Insurance.

FORMER COURT DECISIONS.

But it can no longer be successfully argued or maintained, at home or abroad, that solicitors, Examiners, referees, or other company representatives, are agents of the parties who become insured, and when the significant facts are added that, with us, the Medical Examiner receives his appointment from the company, acts under its instructions, deals with it in all its functions, and is paid by it for its services, it must be assumed upon authority that the office or relation of the Examiner to his company is one of agency for certain important purposes. And here agency means responsibility in a broad sense. The Examiner's acts under these new contract clauses become his principal's, his company's, acts, and the corporation is bound by them within the scope of his authority. That authority now undertakes to cover the whole range of negotiation between the applicant and the company, and the Examiner is made the sponsor for the truth or falsehood, the good or bad faith of the applicant whose statements are "the basis of the contract," and upon whom should always rest the force and effect of the warranty, the first and last consequences of misrepresentation or fraud.

The courts have defined the powers and duties of the Examiner in various cases, but the same decisions often turn upon the competence of certain evidence, the admission of medical testimony, or the waiver of rights under statutes as to privileged communications, and to avoid confusion these questions are treated together in the citations of authorities.

NOTE.—In several of the States of the Union, notably in New York, Missouri, Wisconsin, Michigan, Iowa, Nebraska and Illinois, there are statutes making the knowledge or information derived by a physician from his patient a privileged communication, and, in some of the States, the statutes have been construed to cover the information or knowledge derived by the Medical Examiner as attending physician and in the matter of making certificates of loss and of testifying as to the causes of death under life insurance policies. At common law no such privilege existed (and the English rule now does not exempt the report of the medical officer, and the courts will order its production if the insured makes out a *prima facie* case), and it is, therefore, purely statutory.

Its significance lies in the fact that if the medical officer is the agent of the company for certain purposes, and does the agent's work, when his testimony may be most needed to defend his company from fraud, or possibly to uphold the integrity or wisdom of his own acts, it may be inadmissible or incompetent by the intervention of the remedial statutes of privilege.

For information, the New York statute in this behalf, which served as a model for others, is here cited: "A person only authorized to practice

physic or surgery, shall not be allowed to disclose any information which he acquired in attending a patient in a professional capacity, and which was necessary to enable him to act in that capacity." Code of Civil Procedure, S. 834.

To meet this intervention of the statutes, and neutralize or destroy their force in suits upon policies, some of the companies have recently incorporated in their contracts express waivers of these statutory rights, relying upon a very recent amendment to the statute of one State, that they should attach "unless the provisions thereof are expressly waived." Then follow, in the pamphlet referred to, numerous CITATIONS FROM STANDARD LAW REPORTS, from which Mr. Taylor deduces these conclusions:

LATEST COURT DECISIONS.

In the light of these precedents cited, it seems to be settled as matters of law, to be observed in writing life policies:

(1.) That the Medical Examiner's legal and proper office is to determine the physical character and condition of the applicant for insurance, and to give the company his professional experience and judgment in that matter.

(2.) That he is the company's agent for these important purposes, and the compay is bound by his acts within his authority and instructions.

(3.) That the testimony of the Examiner in suits upon life policies as attending physician, is not competent under the statutes as to privileged communications, and the benefits and rights under these statutes may not be waived by the insured to find an executor or administrator, for he represents the decedent simply in reference to the rights of property, and not for the purpose of making such a waiver; and the medical report, as a part of the contract, offers in this respect no legal advantage.

(4.) That the courts will relieve from the obligations of a strict warranty in a policy of insurance that contains contradictory or doubtful provisions, or that in any manner leaves room for construction as to the exact literal truth of all the applicant's statements as a condition precedent.

(5.) That the answers, statements and declarations made by an applicant to the Medical Examiner in his report in the company's behalf, are construed to be representations, and not warranties, and may therefore be substantially and not literally true, and are fulfilled if reasonable and given in good faith, as to material facts as to which inquiry is made, and about which the applicant has, or should be presumed to have, actual knowledge or information.

THEIR BEARINGS ON LIFE INSURANCE.

Mr. Taylor thus analyzes their practical application to the duties of all connected with the life insurance business.

(1.) *To everyone* who has to do with the serious business of making contracts of life insurance these simple but fundamental principles and rules of construction bear a practical meaning. They abide in the contract, despite all clever provisions to the contrary, both in its inception and its performance; the courts have so determined, and the prudent underwriter will take full account of them in framing the company's promises to pay.

(2.) *To the applicant* the whole question is one of good faith, of literal truth, of warranty as to all facts he actually knows, and of reliable information and honest belief as to all matters of which he has no personal knowledge, and this is the only true basis of the contract.

(3.) *To the agent*, upon whom falls, in nearly every instance, the delicate task of eliciting and recording the applicant's statement, the duty is one of exact presentation of all the facts, and

the scrupulous avoidance of hints, suggestions or modifications that may mislead the company in its estimate of the value of the risk proposed, and the critical test here, as in the former instance, is the plain truth.

(4.) *To certain of the companies* there is, under these settled doctrines, a plain necessity to limit and not to enlarge the physician's responsibilities as to matters of contract; to make the warranty of the insured fair and reasonable, and absolute in its government of all questions of fact and personal knowledge in the application; to avoid all makeshifts in legal phraseology, which transfer the obligations of absolute truth and good faith, the virtue and legal force of the warranty, from the man who insures to "the Medical Examiner or any other person;" to abandon a practice which may sacrifice to mere competition the ability of a company to fight patent fraud (a duty the law in any event compels), and risks a meritorious defense upon a doubtful warranty or the testimony of disqualified witnesses, or upon waivers that are inoperative; to use reasonable diligence and prudence—that is, such diligence and prudence as men usually exercise in the management of their own affairs—that moneys shall be paid out of their treasuries only when lawfully due upon contracts with clear and well-settled conditions, since "the doubt as to the intention of the parties must, according to the settled doctrines of the law of insurance, recognized in all the adjudged cases, be resolved against the party whose language it becomes necessary to interpret."

(5.) *To the Medical Examiner*, however, these judicial definitions have a special present interest and value, for they declare what his true office is, what its limitations are, in what relation he stands to a company, and his statutory disqualifications as a witness under given circumstances. It must be granted upon these authorities that the legal duty of the medical officer is to ascertain and report to the company in accordance with the instructions furnished him, the health or the sanitary or physical condition of the applicant, or whether he is laboring under, or is subject to, any disease or defect which may have a tendency to shorten life. And this is also the duty which hitherto the companies, in their history, their customs, their methods of business, their literature, and notably in their contracts, have assigned to the Examiner. In the performance of this office the law declares the Examiner the company's agent for specific purposes; and this is his true relation to the company he serves. The agency, however, is a limited one, and therefore upon authority to be strictly pursued; and its character is wholly determined by the company's commission or instructions.

And it is here the question of safety or experiment in writing life insurance policies is settled, and the experience of the underwriters in the courts and the significance of the decisions should have proper weight. A choice must be made between a contract declared to be valid and sufficient upon an express, affirmative warranty of essential facts, and one that invites defeat upon a warranty of statements to the Examiner, which the law declares to be only representations, and which must go to a jury for a verdict as to their materiality or truth. The argument for a correct judgment, and for forms and instructions to protect it, seems "incontestable" and "free from technicalities." The real problem is how to limit the Medical Examiner's relations to the contract, not how to enlarge them, and the authorities point out the practical solution in a complete separation of the application from the medical examination, the omission of all related questions under the warranty, and the strict limitation of the Examiner's agency and service to his duty as the law defines it.

And the physician need not be a passive factor in this important matter. He may, with reason and propriety, insist upon the simplicity of his legal duty, and his privilege to be exempt as the keeper of the applicant's conscience, the tutor of his moral perceptions, or the guardian of the agent's integrity; and that he should not be made the attorney of either party, or the arbitrator of any legal question when a policy of life insurance is written, or when the proofs of its maturity are presented.

No man in the business of life insurance fills a more honorable or responsible station than the medical officer who is thoroughly trained in his work, and who always does it without fear or favor, and he should be made to serve no experiments or expedients.

For a more extended consideration of this subject, the reader is referred to the pamphlet itself.

II.—AGENTS' REPORT.

This is the term usually employed to designate that portion of an application which embodies the request of the applicant to the company for insurance, and is signed by the applicant and attested by the agent before the medical examination is proceeded with.

The following are some of the conditions imposed upon the applicant by one of the prominent companies:

OTHER FORMALITIES, to which the applicant is required to subscribe, are as follows—printed on the back of the application: "Subject to the charter of said company and the laws of said State, *I hereby apply* to The Life Insurance Company of———, for $——, amount of insurance on my life, upon the (plan of insurance, either life or distribution). 2. My full name. 3. Occupation. 4. Residence. 5. Place of business. 6. P. O. address. 7. If any intention exists of changing residence, or occupation; state in what manner. 8. Place of birth. 9. Date of birth. 10. Kind of policy. 11. Premium payable—quarterly, semi-annually, or annually. 12. Full name and residence of person to whom insurance is payable. 13. Relationship to the person whose life is proposed for insurance. 14. If insured in this or any other company, give name of company and amount. 15. If any proposition or negotiation, or examination for life insurance, has been made in this or any other company, or association, on which a policy has not been issued, state when and in what company.

"*I hereby warrant and agree* not to reside or travel in any part of the torrid zone, and not to engage in any specially hazardous occupation or employment during the next two years following the date of issue of the policy for which application is hereby made, without first obtaining permission from this company; and I also warrant and agree that I will not die by my own voluntary act during the said period of two years.

"(*The specially hazardous occupations*, or employments herein referred to, are: Blasting, mining, sub-marine labor, aeronautic ascensions, Arctic explorations, the manufacture of highly explosive substances, service upon any railroad train, or in switching or in coupling cars, or in any steam or other vessel, or military or naval service in time of war.) *I also agree* that all the foregoing statements and answers, as well as those that I make, or shall make, to the company's Medical Examiner, in continuance of this application, are by me warranted to be true and are offered to the company as a consideration of the contract, which shall not take effect until the first premium shall have been paid during my life and continuance in good health.

"*I certify* that I am temperate in my habits, and am, to the best of my knowledge and belief, in sound physical condition and a satisfactory subject for life insurance. Date, signatures of applicant and a witness."

III.—INSTRUCTIONS TO AGENTS.

It very often occurs that agents call upon the Medical Examiner of the locality in which he resides, for information as to the insurability of certain candidates whose health record or physical condition present some disqualifying features. To assist the Medical Examiner in this duty, one large company* issues the following scheme to its agents for their own information :

MEMORANDUM OF CIRCUMSTANCES AFFECTING THE ASSURABILITY OF LIVES.

In order to save would-be patrons the annoyance of futile application for a policy in this society, the following memorandum is offered of some of the more commonly occurring circumstances held by the Medical Directors to seriously affect life assurability. In practice, the degree and period of disqualification are ordinarly as stated, but it is to be understood that the company reserves the privilege of accepting or declining at will any given proposal. In the case of lives falling within any of the questionable categories, correspondence with the Medical Directors is invited before formal application for insurance is made. Opinions upon the assurability of given lives are always cheerfully furnished. In submitting a case, the fullest particulars should be given.

I.—PERMANENTLY DISQUALIFYING.

1. Any history—past or present—of the following diseases :

Apoplexy.
Paralysis of one side of the body ("hemiplegia").
Delirium tremens.
Tertiary or inherited syphilis.
Cancer, sarcoma, or other "malignant" disease.

2. A history of attacks, sufficiently numerous to seemingly portend a predisposition thereto, of any one of the following diseases or conditions (N. B.—Cases falling within this category are passed upon according to individual merits) :

Epileptic fits.
Sunstroke.
Articular rheumatism.
Gout.
Erysipelas.
Hemorrhage from the air passages.
Bronchitis.
Pleurisy
Gravel.
Calculus (urinary or hepatic).
Albuminuria.
Hepatic colic.

In general, any recurring affection of an important organ.

* The Equitable Life Assurance Society of the United States.

3. The existence of any of the following chronic conditions:

Es ablished extreme leanness.
Established extreme obesity.
Humpback (angular curvature of the spine).
Valvular disease of the heart.
Enlargement of the heart.
Considerable pleuritic adhesions.
Considerable emphysema of the lungs.
Considerable consolidation of a lung.
Irreducible hernia.
Enlarged prostate.

In general, any pronounced incurable organic affection of a vital organ.

II.—Temporarily Disqualifying.

1. The existence of any of the following diseases or conditions disqualifies for the time being, but yet not necessarily for longer than the period of actual continuance:

An open sore or ulcer of any considerable size.
Diseased bone ("caries," "necrosis").
Fistula (notably fistula-in-ano).
Purulent discharge from the ear (otorrhœa).
Habitual cough.
Recurring asthma.
Pulse-rate over ninety or under fifty per minute.
Organic stricture of the urethra.
Stone in the bladder.

In general, pronounced derangement of any important organ or function.

2. The occurrence of any of the following diseases or conditions disqualifies, not only for the time being, but also for a term after final disappearance, according to the case:

Articular rheumatism—minimum term of subsequent disqualification, one year.
Chancre, not followed by constitutional symptoms—minimum term, six months.
Secondary syphilis, not followed by tertiary symptoms—minimum term, five years after last manifestation.
Albuminous urine—term according to case.
Saccharine urine—term according to case.
Hemorrhage from the air passages—minimum term, ten years.
Passage of a urinary calculus—minimum term, five years.
Discharge of a tape-worm—minimum term, six months.
Intemperance (systematic or occasional)—term according to case.

III.—Variously Disqualifying.—(Cases judged individually.)

1. Death of both parents from consumption ordinarily disqualifies, at least during early and middle life, unless the applicant be of robust physique, while, at the same time, there were exceptional extenuating circumstances attending one or both cases of death.

2. Death of one parent, or of more than one among brothers and sisters, from consumption, ordinarily disqualifies during early adult life (up to about thirty years of age) except as above.

3. Multiplying cases of consumption in the family prejudice a risk in constantly increasing ratio.

4. Family proclivity to any individual fatally-tending disease, or to insanity, suicide or abuse of alcoholic drinks or narcotic drugs, is prejudicial according to case.

IV —NOT DISQUALIFYING, BUT ENTAILING SPECIAL CONTRACT OR SPECIAL RATE OF PREMIUM.

Reducible hernia—special contract that death from neglect to wear a controlling truss is not insured against.

Lack of successful vaccination—special contract that death from small-pox is not insured against.

Total blindness—one-half per cent extra premium chargeable.

Total deafness—one-half per cent extra premium chargeable.

Loss of lower extremity above the knee—one-quarter per cent extra premium chargeable.

Female sex—one-half per cent extra premium chargeable until after attainment of age forty-eight.

Negro blood, pure or mixed—one-half per cent extra premium chargeable to residents outside of the tropics.

Occupation of locomotive engineer, railroad conductor, train-hand, switchman or coupler of cars—one-fourth to two per cent extra premium chargeable.

Extra hazardous occupation, generally; as, for instance, mining or sea-faring—one-half to one per cent extra premium chargeable

Occupation of proprietor of inn or small hotel, or of merchant in, or manufacturer of, alcoholic drinks of any kind, where the business is strictly wholesale—extra premium of one-half per cent chargeable. (N B.—Any occupation involving personal attention to the retailing of alcoholic drinks disqualifies absolutely. Such disqualification, therefore, attaches to such distillers, brewers, or wine or liquor merchants as sell at retail, to saloon-keepers and to bar-tenders.)

IV.—LIFE INSURANCE STATISTICS.

MALE LIFE DISEASES AND NUMBER OF DEATHS BY STATES AND TERRITORIES, ETC., IN TWENTY-SEVEN LIFE INSURANCE COMPANIES DURING A PERIOD OF THIRTY YEARS.*

STATES AND TERRITORIES.	Typhoid and Typhus.	Other Zymotic.	Consumption.	Other Constitutional.	Apoplexy.	Other Nervous.	Heart Diseases.	Pneumonia.	Other Respiratory.	Digestive System.	Kidney Diseases.	Injuries and Accidents.	Suicides.	All Other Diseases.	All Causes.
Alabama	10	50	26	7	10	23	12	20	22	40	5	26	3	6	206
Arkansas	..	21	6	3	2	8	4	11	1	10	..	11	..	5	82
California	38	78	121	38	47	84	67	63	38	65	20	92	24	30	805
Colorado	1	1	3	1	2	1	1	2	2	2	..	6	1	1	24
Connecticut	179	165	314	96	67	148	131	108	71	122	42	103	19	83	1,648
Delaware	4	11	10	4	3	3	2	7	2	11	..	3	..	..	60
District of Columbia	7	23	50	7	9	21	9	19	13	17	4	8	4	12	203
Florida	1	10	10	..	..	4	6	3	3	2	..	7	..	2	48
Georgia	8	45	20	6	12	20	7	16	14	25	2	14	1	7	197
Idaho	1	..	..	..	..	1	..	..	..	..	..	4	..		6
Illinois	151	270	398	106	92	233	105	235	143	261	46	206	25	76	2 338
Indiana	63	135	181	37	24	92	38	126	68	98	11	83	12	28	996
Iowa	33	65	97	28	19	73	36	46	38	62	11	39	9	22	578
Kansas	11	21	19	7	1	14	3	13	5	13	4	22	4	4	141
Kentucky	19	73	93	24	33	49	26	53	33	49	8	57	19	21	557
Louisiana	9	112	54	12	18	44	13	15	14	50	10	31	2	14	398
Maine	74	114	158	47	18	79	34	48	50	64	12	73	12	33	816
Maryland	54	104	176	57	59	113	66	82	57	91	22	49	6	43	979
Massachusetts	297	392	857	229	182	379	244	245	207	275	136	359	51	225	4 108
Michigan	69	105	162	41	40	77	51	91	55	95	13	88	21	37	945
Minnesota	43	20	70	9	21	29	20	30	25	30	9	40	2	8	356
Mississippi	7	54	26	9	13	14	9	20	10	24	2	19	1	12	220
Missouri	75	277	178	49	66	122	49	101	71	120	16	99	17	62	1,302
Montana, Nebraska and Nevada	9	13	11	5	2	14	2	10	6	14	1	16	1	4	108
New Hampshire	58	60	110	22	33	65	23	40	40	56	13	41	5	34	600
New Jersey	54	97	249	44	49	97	74	73	46	95	32	52	11	56	1,029
New Mexi o	..	..	..	..	1	..	3	..	1	..	..	..	..	1	6
New York	449	643	1,431	395	424	768	474	572	473	661	290	422	95	46	7,443
North Carolina	7	39	25	7	6	14	8	17	11	29	3	9	..	6	181
Ohio	140	232	408	91	111	203	91	166	160	233	38	185	33	35	2.186
Oregon	2	3	8	3	3	1	1	3	3	3	..	5	1	..	36
Pennsylvania	199	264	575	167	135	291	195	174	157	325	85	174	35	170	2,949
Rhode Island	15	38	80	24	26	42	29	30	11	35	10	16	3	18	377
South Carolina	3	13	14	6	10	10	4	9	7	17	3	2	..	3	101
Tennessee	8	160	63	8	24	22	16	27	16	46	4	27	6	14	441
Texas	7	51	20	10	9	18	6	20	13	34	1	21	5	10	225
Utah	..	..	..	..	1	3	..	1	1	2	..	1	..	..	9
Vermont	25	33	58	8	13	24	17	23	15	29	1	21	2	12	281
Virginia	15	33	34	5	13	17	17	14	9	17	3	20	1	7	205
Washington	..	1	1	..	1	1	..	2	..	..	..	..	..	..	6
West Virginia	5	6	13	1	10	10	2	7	5	15	..	5	1	4	84
Wisconsin	121	142	227	71	46	106	51	114	86	145	17	139	33	64	1,362
Unknown	1	5	2	1	..	..	..	4	1	1	1	4	1	24	45
British America	29	37	73	9	23	45	24	36	45	39	10	46	5	19	439
Other foreign	6	33	41	11	25	21	17	16	17	22	2	33	3	17	264
Totals	2,307	4,049	6,472	1,705	1,703	3.403	1,987	2,711	2,056	3,345	887	2,678	474	1,665	35,442

* A treatise on the records of thirty American life offices. By Levi W. Meech, in charge of a committee of actuaries.

PROPORTIONAL DEATHS AND DISEASES TO 10,000 MALES LIVING IN EACH GROUP OF STATES.

Group of States	I.	II.	III.	IV.	V.	VI.	VII.	MEAN GROUP.	GROUPS.
All causes	105.3	97.7	107.1	104.5	130.5	170.5	112.2		
SUMMARY:									
Zymotic	17.6	18.5	16.6	18.7	27.5	48.4	15.9	23 3	I.
Constitutional	26 4	21.4	27 9	23.0	27.3	26 3	22.1	24.9	
Nervous	15.4	11.5	15 4	14 4	20.1	22.3	18.4	16.8	New England.
Circulatory	6.6	4.4	7.3	4.6	6.7	6.8	9.2	6.5	New York.
Respiratory	13.3	14.6	12.1	16.6	18.1	21.5	14.6	15.8	
Digestive	8.6	10 0	11.2	11.2	11.9	22 0	9.1	12 0	
Miscellaneous	17.4	17.3	16.6	16 0	18.9	23.2	22.9	18.9	II.
ZYMOTIC:									*Northwest.*
Typhoid, typhus	7.6	8.5	6.8	6.7	6 9	4 8	5.2	6.6	Michigan.
Malarial fever	1.7	2 3	1.8	3.3	3.8	11.8	1.9	3.8	Wisconsin.
Erysipelas	1 0	1.3	1.0	1 3	1 3	1.5	2 2	1.4	Minnesota.
Dysentery	1.7	1.4	.9	1.4	3.6	5.8	1.5	2 3	Nebraska.
Diarrhœa	.9	.7	1 0	1.8	1.6	3.6	.2	1.3	
Cholera	.9	.8	1 1	2.0	3.5	2 4	.9	1.7	
Alcoholism	.3	.3	.3	.4	.5	.3	.6	.4	III.
Other zymotic	3.6	3 2	3.7	2.8	6.3	18.2	3.4	5 9	
CONSTITUTIONAL:									New Jersey. Pennsylvania.
Dropsy	1.8	1 6	2 6	1 9	2.2	2 2	1.9	2.0	
Cancer	2.1	1.5	2 1	1 6	2 2	1.1	1.9	1.8	
Consumption	20.8	16 9	22.2	18.5	21.5	21.0	16 9	19.7	IV.
Other constitutional	1 7	1.4	1 0	1.0	1.4	2 0	1.4	1 4	
NERVOUS:									Ohio. Indiana.
Apoplexy	5.2	3.8	5.0	4.2	7.2	8.2	6.8	5.8	Illinois.
Congestion of brain	1.5	1 5	2 1	2 5	2.9	4.9	1.7	2.4	Iowa.
Paralysis, softening brain	7.2	5 2	6 5	6.2	7.8	7.5	7.3	6.8	Kansas.
Epilepsy, convulsions	.3	.3	.6	.4	.5	.7	1.5	.6	
Other nervous	1.2	.7	1.2	1.1	1.7	1.0	1.1	1.1	
CIRCULATORY:									V.
Diseases of heart	6.1	4.1	7.1	4.4	6.3	6.6	7.4	6.0	Delaware.
Other circulatory	.5	.3	.2	.2	.4	.2	1.8	.5	Maryland.
RESPIRATORY:									Dist. Columbia Virginia.
Pneumonia	7.3	8 5	6 6	9.8	10 8	12.6	9.0	9.2	Kentucky.
Congestion lungs	1 8	1.7	1.2	1 7	22 2	22.2	.9	1.7	Missouri.
Bronchitis, pleurisy	1 8	2.0	1.5	2.0	1 8	3.4	2.2	2.1	
Abscess, hemorrhage lungs	1.9	2.0	2.0	2.4	2.4	1.9	1.8	2.1	VI.
Other respiratory	.4	.4	.8	.7	.9	1.4	.7	.8	
DIGESTIVE:									*South of* 36° 30'. North Carolina
Diseases of stomach	1.6	2.2	2.0	1.9	2.1	5.1	1.3	2.3	South Carolina
Diseases of bowels	1.9	2.2	2.5	2.5	2.5	5.8	1 6	2.7	Tennessee.
Peritonitis	.7	.8	1.0	.8	.7	.5	.3	.7	Georgia.
Diseases of liver	2.7	2.4	3.7	3 7	3.9	4.8	4.2	3.6	Florida.
Other digestive	1.7	2.3	2 0	2 3	2.7	5.8	1.7	2.6	Alabama. Mississippi.
MISCELLANEOUS:									Arkansas.
Diabetes	.5	.5	.5	.4	.8	.3	.6	.5	Louisiana.
Diseases of kidney	3.5	1.4	3.1	1.9	2.1	2 4	2.6	2.4	Texas.
Other urinary	.9	.8	1 1	.5	.9	1 2	.7	.9	
Childbirth, puerperal diseases	..	..	..	..	.	..	..	..	VII.
Diseases breast and uterus	..	..	..	..	..	..	..	..	
Abscesses, hemorrhage, and old age	1.2	.8	1.1	1.1	1.3	1.0	.3	1.0	Washington. Oregon.
Debility, exhaustion, etc.	1 0	1.0	2 4	.7	1.3	1.1	1 2	1.2	California.
Accidents, injuries	7.2	9 7	6.0	9.0	9 3	13.3	12 8	9.6	Utah.
Suicides	1.3	2 1	1.3	1 3	1.8	1 4	3 3	1.8	Dakota.
Unknown causes	1.8	1.0	1.1	1.1	1.4	2.5	1.3	1.5	New Mexico.
	15,273	2,716	3,976	6,239	3,306	2,153	863	....	

A SANITARY SURVEY OF THE UNITED STATES.

The respective annexed figures are arranged in ascending order, to show the proportional deaths by each disease among 10,000 insured males living in each group of States.

The columns with single figures refer to the seven groups of States in the margin.

Diseases.	Least Mortality.								Greatest Mortality.								Mean.	Group.
All causes	2	97 7	4	104.5	1	105.3	3	107.1	7	112.2	5	130.5	6	170 5			118.3	
SUMMARY:																		
Zymotic	7	15.9	3	16.6	1	17.6	2	18.5	4	18.7	5	27.5	6	48 4			23.3	1.
Constitutional	2	21 4	7	22 1	4	23 0	6	26.3	1	26 4	5	27 3	3	24 9			24.9	
Circulatory	2	11.5	4	14 4	1	15.4	3	15.4	7	18 4	5	20.1	6	22.3			16.8	New England.
Nervous	2	4.4	4	4.6	1	6 6	5	6 7	6	6 8	3	7.3	7	9 2			6.5	New York.
Respiratory	3	12.1	1	13.3	2	14 6	7	14.6	4	16.6	5	18.1	6	21 5			15.8	
Digestive	1	8.6	7	9 1	2	10.0	3	11.2	4	11.2	5	11.9	6	22 0			12.0	
Miscellaneous	4	16.0	3	16.6	2	17.3	1	17 4	5	18 9	7	22 9	6	23 2			18 9	2.
ZYMOTIC:																		*Northwest.*
Typhoid and typhus	6	4.8	7	5 2	4	6.7	3	6.8	5	6.9	1	7.6	2	8 5			6 6	Michigan.
Malarial fever	1	1 7	3	1 8	7	1.9	2	2.3	4	3.3	5	3.8	6	11 8			3.8	Wisconsin.
Erysipelas	1	1.0	3	1.0	2	1.3	4	1.3	5	1 3	6	1.5	7	2 2			1.4	Minnesota.
Dysentery	3	9	2	1 4	4	1.4	7	1.5	1	1.7	5	3.6	6	5.8			2.3	Nebraska.
Diarrhœa	7	.2	2	.7	4	.8	1	.9	3	1.0	5	1.6	6	3 6			1.3	
Cholera	2	.8	1	.9	7	.9	3	1.1	4	2.0	6	2 4	5	3.5			1.7	
Alcoholism	6	.3	1	.3	2	.3	3	.3	4	.4	5	.5	7	.6			4	3.
Other zymotic	4	2.8	2	3 2	7	3.4	1	3 6	3	3 7	5	6 3	6	18 2			5.9	
CONSTITUTIONAL:																		New Jersey. Penn ylvania.
Dropsy	2	1 6	1	1.8	4	1 9	7	1 9	6	2.2	5	2.2	3	2.6			2.0	
Cancer	6	1 1	2	1.5	4	1 6	7	1.9	1	2.1	3	2.1	5	2 2			1 8	
Consumption	7	16.9	2	16.9	4	18.5	1	20.8	6	21.0	5	21.5	3	22.2			19.7	4.
Other constitutional	3	1.0	3	1.0	2	1.4	5	1.4	7	1.4	1	1.7	6	2.0			1 4	
NERVOUS:																		Ohio. Indi na.
Apoplexy	2	3.8	4	4 2	3	5.0	1	5 2	7	6.8	5	7.2	6	8 2			5 8	Illinois.
Congestion of brain	1	1 5	2	1 5	7	1 7	3	2 1	4	2.5	5	2 9	6	4 9			2 4	Iowa.
Paralysis, softening of brain	2	5.2	4	6 2	3	6.5	1	7.2	7	7.3	6	7 5	5	7.8			6.8	Kansas.
Epilepsy, convulsions	1	.3	2	.3	4	.4	5	5	3	.6	6	.7	7	1.5			.6	
Other nervous	2	.7	6	1.0	7	1 1	4	1.1	3	1 2	1	1 2	5	1 7			1.1	5.
CIRCULATORY:																		Delaware.
Diseases of heart	2	4.1	4	4 4	1	6.1	5	6.3	6	6.6	3	7.1	7	7.4			6.0	Maryland.
Other circulatory	6	.2	4	.2	3	.2	2	.3	5	.4	1	.5	7	1 8			.5	Dist. Columbia Virginia. Kentucky.
RESPIRATORY:																		
Pneumonia	3	6.6	1	7.3	2	8.5	7	2.0	4	9.8	5	10 8	6	12 6			9.2	Missouri.
Congestion of lungs	7	.9	3	1.2	2	1 7	4	1.7	1	1 8	5	2.2	6	2 2			1.7	
Bronchitis, pleurisy	3	1.5	5	1.8	1	1.8	2	2 0	4	2.0	7	2.2	6	3.4			1 7	
Abscess, hemorrhage of lungs	7	1.8	6	1.9	1	1.9	3	2 0	2	2.0	5	2.4	4	2.4			2.1	6. *South of* 36° 30′.
Other respiratory	1	4	2	.4	7	.7	4	.7	3	.8	5	.9	6	1.4			.8	North Carolina South Carolina Tennessee.
DIGESTIVE:																		
Diseases of stomach	7	1.3	1	1.6	4	1.9	3	2.0	5	2.1	2	2.3	6	5.1			2.3	Georgia.
Diseases of bowels	7	.9	1	1 2	2	1.7	3	1.7	4	1.8	5	2.2	6	2.2			2.7	Florida
Peritonitis	7	1 5	6	1.8	1	1.8	5	2.0	2	2 0	4	2.2	3	3 4			2.1	Alabama.
Diseases of liver	2	1 8	1	1.9	3	1.9	4	2.0	5	2.0	7	2 4	6	2.4			2.1	Arkansas.
Other digestive	7	.4	1	.4	3	.7	2	.7	4	.8	5	.9	6	1.4			.8	Louisiana. Texas.
MISCELLANEOUS:																		
Diabetes	6	.3	4	.4	3	.5	2	.5	1	.5	7	.6	5	.8			.5	
Diseases of kidney	2	1 4	3	1 9	5	2.1	6	2 4	7	2 6	3	3.1	1	3.5			2 4	7.
Other urinary	4	.5	7	.7	2	.8	1	.9	5	.9	3	1.1	6	1.2			.9	
Abscess, hemorrhage, old age	7	.3	2	.8	6	1.0	3	1 1	4	1.1	1	1.2	5	1.3			1.0	*Pacific, etc.* Washington. Oregon.
Debility, exhaustion and prostration	4	.7	2	1.0	1	1.0	6	1.1	7	1.2	5	1.3	3	2 4			1 2	California.
Accidents	3	.6	1	7.2	4	9.0	5	9.3	2	9 7	7	12 8	6	13.3			9 6	Dakota.
Suicides	1	1 3	3	1.3	4	1.3	6	1.4	5	1.8	2	2.1	7	3.3			1 8	Utah.
Unknown causes	2	1.0	3	1.1	4	1 1	7	1.3	5	1 4	1	1.8	6	2 5			1 5	

A GENERAL TABLE OF DISEASES AND DEATHS IN TWENTY-SEVEN LIFE INSURANCE COMPANIES DURING A PERIOD OF THIRTY YEARS.

DISEASES.	NUMBER OF DEATHS.			Per Cent of Total.
	Males.	Females.	Total.	
All causes	35,442	2,182	37,624	100 00
SUMMARY.				
Zymotic	6,356	303	6,659	17 70
Constitutional diseases	8,175	548	8,723	23.19
Nervous diseases	5,106	193	5,299	14.08
Circulatory diseases	1,986	100	2,092	5.56
Respiratory diseases	4,771	291	5,062	13.45
Digestive diseases	3,344	273	3,617	9.61
Miscellaneous diseases	5,704	468	6,172	16 42
ZYMOTIC DISEASES:				
Typhoid fever	2,147	107	2,254	5 99
Typhus fever	159	11	170	.45
Cerebro-spinal fever	23	1	24	.06
Yellow fever	252	6	258	.69
Remittent fever	412	25	437	1.16
Intermittent fever	159	7	166	.44
Congestive fever	213	13	226	.60
Typho-malarial fever	46	4	50	.13
Fever	255	12	267	.71
Smallpox	298	7	305	.81
Measles	13	2	15	.04
Scarlet fever	38	2	40	.11
Diphtheria and malignant sore throat	127	6	133	.35
Erysipelas	374	10	384	1.02
Pyæmia	70	4	74	.20
Carbuncle	62	1	63	.17
Influenza	12	2	14	.04
Dysentery	587	35	622	1.65
Diarrhœa	328	22	350	.93
Cholera	431	15	446	1.19
Cholera morbus	195	8	203	.54
Goitre	4	0	4	.01
Malignant pustule	11	0	11	.03
Glanders	1	0	1	.00
Purpura hemorrhagica	21	0	21	.06
Alcoholism	117	1	118	.31
Other zymotic diseases	1	2	3	.00
CONSTITUTIONAL DISEASES:				
Anæmia	59	12	71	.19
Cancer	621	44	665	1.77
Dropsy	622	56	678	1.80
Gout	63	0	23	.06
Rheumatism	169	11	180	.48
Gangrene	51	0	51	.14
Tubercular meningitis	10	1	11	.03
Lumbar abscess	11	0	11	.03
Scrofula	25	6	31	.08
Tabes mesenterica	88	5	93	.25
Morbus coxæ	12	0	12	.03
Consumption	6,474	412	6,886	18.31
Other constitutional diseases	10	1	....	.03

GENERAL TABLE OF DISEASES AND DEATHS—*Continued.*

DISEASES.	NUMBER OF DEATHS.			Per Cent of To al.
	Males.	Females.	Total.	
All causes	35,442	2,182	37,624	100 00
NERVOUS DISEASES:				
Apoplexy	1,705	61	1,766	4 70
Congestion of the brain	655	14	669	1.78
Softening of the brain	399	9	408	1.09
Paralysis	841	32	873	2.32
Disease of the brain	721	37	758	2.02
Convulsions and epilepsy	130	8	138	.37
Insanity	140	6	146	39
Anxiety	2	0	2	.01
Fright	1	0	1	.0)
Encephalitis	277	10	287	.76
Cerebro-spinal sclerosis	1	0	1	.00
Cerebral embolism	1	0	1	.00
Anæmia of the brain	8	0	8	.02
Effusion on the brain	48	3	51	.14
Neuralgia	17	1	18	.05
Progressive muscular atrophy	3	0	3	.01
Tetanus	47	4	51	.14
Inflammation of the spinal cord	18	0	18	.05
Disease of the spinal cord	41	2	43	.11
Congestion of the spinal cord	3	0	3	.01
Other nervous diseases	48	6	54	.14
CIRCULATORY DISEASES:				
Disease of the heart	1,297	62	1,359	3.61
Pericarditis and endocarditis	104	9	113	.30
Hypertrophy of the heart	100	4	104	.28
Valvular disease of the heart	98	6	104	.28
Fatty degeneration of the heart	42	3	45	.12
Dropsy of the heart	56	6	62	.16
Atrophy of the heart	4	0	4	.01
Paralysis of the heart	27	1	28	.07
Rheumatism of the heart	66	6	72	.19
Abscess of the heart	5	0	5	.01
Angina pectoris	79	4	83	.22
Aneurism of aorta	51	1	52	.14
Rupture of aorta	16	1	17	.05
Embolus of pulmonary artery	5	1	6	.02
Phlebitis	18	0	18	.05
Other circulatory diseases	18	2	20	.05
RESPIRATORY DISEASES:				
Epistaxis	8	0		.02
Disease of larynx	112	3	115	.31
Bronchitis	437	21	458	1.21
Pleurisy	172	7	179	.48
Congestion of lungs	568	20	597	1.59
Pneumonia	2,713	176	2,889	7.68
Abscess of lungs	78	6	84	.22
Hemorrhage of lungs	283	7	290	.77
Disease of lungs	264	31	295	.78
Emphysema, asthma	63	8	71	.19
Pulmonary apoplexy	34	1	35	.09
Gangrene of lungs	13	0	13	.03

GENERAL TABLE OF DISEASES AND DEATHS—*Continued.*

DISEASES.	NUMBER OF DEATHS.			Per Cent of Total.
	Males.	Females.	Total.	
All causes	35,442	2,182	37,624	100.00
Œdema of lungs	16	0	16	.04
Other respiratory diseases	10	2	12	.03
DIGESTIVE DISEASES.				
Inflammation of the stomach	319	39	358	.95
Ulceration of stomach	75	6	81	.22
Disease of stomach	150	5	155	.41
Hemorrhage of stomach	57	1	58	.15
Congestion of stomach	23	2	25	07
Tumor of stomach	4	0	4	.01
Inflammation of bowels	425	45	470	1.25
Ulceration of bowels	67	6	73	.19
Hemorrhage of bowels	84	2	86	.23
Congestion of bowels	22	5	27	.07
Disease of bowels	100	10	110	.29
Obstruction of bowels	36	1	37	.10
Perforation of bowels	6	1	7	.02
Peritonitis	246	41	287	.76
Gastro-enteritis	165	17	182	.48
Disease of stomach and bowels	127	7	134	.36
Strangulated hernia	43	12	55	.15
Colic, tympanites and constipation	69	3	72	.19
Dyspepsia	43	3	46	.12
Gangrene of tongue	3	0	3	.01
Stricture of œsophagus	11	0	11	.03
Fistula in ano	12	0	12	.03
Disease of spleen	22	0	22	.06
Leucocythæmia	7	1	8	02
Ascites	41	8	49	.13
Abdominal tumor	35	3	38	.10
Hemorrhage	9	0	9	.02
Undefined diseases of abdominal organs	75	0	11	.03
Jaundice	11	2	77	.20
Inflammation of liver	268	15	283	.75
Cirrhosis of liver	104	4	108	.29
Abscess of liver	79	7	86	.23
Diseases of liver	448	19	467	1 24
Congestion of liver	63	3	66	.18
Hypertrophy of liver	36	2	38	.10
Acute yellow atrophy of liver	9	0	9	.02
Fatty degeneration of liver	15	1	16	.04
Biliary calculus	15	0	15	.04
Obstruction of hepatic duct	4	0	4	.01
Rupture of gall bladder	2	0	2	.01
Other digestive diseases	14	2	16	.04
MISCELLANEOUS DISEASES:				
Bright's disease	550	17	567	1.51
Inflammation of kidneys	60	1	61	.16
Abscess of kidneys	12	0	12	.03
Tumor of kidneys	1	0	1	..
Disease of kidneys	255	9	264	.70
Diabetes	158	3	161	.43
Addison's disease	12	0	12	.04

GENERAL TABLE OF DISEASES AND DEATHS—*Continued.*

DISEASES.	NUMBER OF DEATHS.			Per Cent of Total.
	Males.	Females.	Total.	
All causes	35 442	2,182	37,624	100 00
MISCELLANEOUS DISEASES—*Cont.*				
Inflammation of bladder	74	2	76	.20
Disease of bladder	54	1	55	.15
Hemorrhage of bladder	5	0	5	.01
Rupture of bladder	1	0	1	..
Urinary calculi	20	1	21	.06
Gravel	33	0	13	.03
Disease of prostate gland	39	0	39	.10
Stricture of urethra	5	0	5	.01
Gangrene of scrotum	1	0	1	..
Other urinary diseases	66	5	71	.19
Childbirth and puerperal diseases	....	197	197	.52
Diseases of breast and uterus	....	110	110	.29
Debility, exhaustion and prostration	377	28	405	1.08
Abscess	117	5	122	.32
Hemorrhage	66	9	75	.20
Tumors	55	3	58	.15
Inflammation of joints	15	0	15	.04
Old age	87	12	99	.26
Accidents and injuries	2,678	34	2,712	7.21
Suicides	475	7	482	1.28
Unknown causes	508	24	532	1.42

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